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STATE OF TENNESSEE

NINETEENTH ANNUAL REPORT

OF THE

MINING DEPARTMENT

R. A. SHIFLETT

CHIEF MINE INSPECTOR
NASHVILLE

MINERAL RESOURCES OF TENNESSEE

1909



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FOLK-KEELIN PRINTING CO.
1910

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STATE OF TENNESSEE

NINETEENTH ANNUAL REPORT

OF THE

MINING DEPARTMENT

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MINING DEPARTMENT OF TENNESSEE

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LETTER OF TRANSMITTAL.

OFFICE OF CHIEF MINE INSPECTOR.

NASHVILLE, TENN., June 15, 1910.

To His Excellency, Hon. Malcolm R. Patterson, Governor of Tennessee:

DEAR SIR: I herewith submit to you the Nineteenth Annual Report of this Department, embracing the mineral resources of Tennessee for the year 1909.

Very respectfully,

R. A. SHIFLETT,

Chief Mine Inspector.

INTRODUCTION

This report records the development of the mineral industries of Tennessee in 1909. Each chapter is a census of the productive features of the industry under discussion.

Owing to the many different units of measurement adopted by the mining industry in reporting mineral product it is impracticable to compare the outputs of the several minerals except as to value of products.

The value of the mineral product of Tennessee in 1909 amounted to \$17,181,460. As compared with 1908, this is a decrease of \$108,397, or 0.62 per cent.

In importance as to value of mineral product, coal ranks first, pig iron second, copper third, stone fourth, clay products fifth, and phosphate rock sixth.

There were 23,360 employes engaged in mining and in the reduction of mineral products who received for their labor the sum of \$8,659,205.

As compared with other States, the rank of Tennessee as to minerals is as follows: coal product, 11; coal value, 12; barytes, 2; clay products, 22; copper, 6; coal gas, 20; gashouse coke, 20; coal tar, 20; iron ore, 7; pig iron, 8; lime, 17; limestone, 12; marble, 3; mineral waters, 24; phosphate rock, 2; pottery, 12; and sand and gravel, 10.

FUELS.

Coal—The production of coal in 1909 amounted to 6,207,483 short tons, valued at \$6,757,824. As compared with 1908, this is an increase in product of 124,632 short tons, or 2.05 per cent, and a decrease in value of \$203,569, or 3 per cent.

Coke—The production of coke in 1909 amounted to 262,750 short tons, valued at \$669,547. As compared with 1908, this is an increase in product of 44,014 short tons, or 20.12 per cent, and an increase in value of \$97,527, or 17.05 per cent.

Gas, gas coke, tar and ammonia—The aggregate value of all products obtained from the distillation of coal in gas works and retort ovens, and of oil and water gas made in 1909, amounted to \$991,991. As compared with 1908, this is an increase of \$3,582, or 0.37 per cent.

METALS.

Copper—The production of copper in 1909 amounted to 19,083,099 pounds, valued at \$2,389,984. As compared with 1908, this is a decrease in product of 376,402 pounds, or 1.93 per cent, and a decrease in value of \$162,146, or 6.35 per cent.

Gold—The production of gold in 1909 amounted to 281 fine ounces, valued at \$5,623. As compared with 1908, this is a decrease in product of 8 fine ounces, or 3 per cent, and a decrease in value of \$250, or 4.45 per cent.

Iron Ore—The production of iron ore in 1909 amounted to 648,825 long tons, valued at \$935,963. As compared with 1908, this is an increase of 59,837 long tons, or 10.16 per cent, and an increase in value of \$127,287, or 15.74 per cent.

Iron, pig—The production of pig iron in 1909 amounted to 330,611 long tons, valued at \$4,473,739. As compared with 1908, this is an increase in product of 41,797 long tons, or 14.50 per cent, and an increase in value of \$743,300, or 20 per cent.

Silver—The production of silver in 1909 amounted to 124,262 fine ounces, valued at \$62,347. As compared with 1908, this is a decrease of 4,287 fine ounces, or 3.34 per cent, and a decrease in value of \$5,610, or 8.25 per cent.

Zinc—The production of zinc in 1909 amounted to 1,573,076 pounds, valued at \$115,969. As compared with 1908, this is an increase in product of 1,201,399 pounds, or 323.24 per cent, and an increase in value of \$89,399, or 336.43 per cent.

STRUCTURAL MATERIALS.

Cement—The production of Portland cement in 1909 amounted to 600,000 barrels, valued at \$480,000. As compared with 1908, this is an increase in product of 328,269 barrels, or 120 per cent, and an increase in value of \$184,087, or 62.20 per cent.

Clay Products—The value of all clay products in 1909 amounted to \$1,352,269. As compared with 1908, this is an increase in value of \$24,656, or 1.86 per cent. The value of brick and tile product amounted to \$1,181,043, which is an increase, as compared with 1908, of \$51,869, or 4.6 per cent. Pottery products were valued at \$86,190, which is a decrease in value as compared with 1908, of \$36,365, or 30 per cent. The production of commercial clay, mined and sold in 1909, by those not manufacturing clay, was valued at \$85,036, which is an increase, as compared with 1908, of \$9,152, or 12.06 per cent.

Lime—The production of lime in 1909 amounted to 84,394 short tons, valued at \$269,512. As compared with 1908, this is an increase in product of 14,640 short tons, or 20.10 per cent, and an increase in value of \$45,276, or 20.19 per cent.

Stone—The value of all stone product in 1909, including limestone, marble and sandstone, amounted to \$1,192,250. As compared with 1908, this is a decrease of \$71,299, or 5.64 per cent.

The production of limestone in 1909 amounted to 904,177 short tons, valued at \$600,190. As compared with 1908, this is an increase in product of 66,284 short tons, or 7.91 per cent, and an increase in value of \$99,513, or 19.86 per cent.

The production of marble in 1909 amounted to 334,274 cubic feet, valued at \$590,585. As compared with 1908, this is a decrease in product of 143,937 cubic feet, or 30.1 per cent, and a decrease in value of \$170,637, or 22.40 per cent.

The production of sandstone in 1909 amounted to 734 short tons, valued at \$1,475. As compared with 1908, this is a decrease in product of 96 short tons, or 11.56 per cent, and a decrease in value of \$175, or 10.6 per cent.

Of the total limestone product, 593,775 short tons, or 65.66 per cent, valued at \$391,420, was used as crushed stone for road making, railroad ballast, and concrete. As compared with 1908, this is an increase in crushed stone product of 21,806 short tons, or 3.81 per cent, and an increase in crushed stone value of \$33,510, or 9.36 per cent. Of the total crushed stone product, 200,124 short tons, valued at \$193,919, were used in the construction of roads. The limestone used for blast furnace flux in 1909 amounted to 231,149 short tons, valued at \$120,972, which is an increase in product, as compared with 1908, of 36,542 short tons, or 18.8 per cent, and an increase in value of \$24,907, or 25.92 per cent.

PIGMENTS.

Barytes—The production of barytes in 1909 amounted to 4,631 short tons, valued at \$6,946. As compared with 1908, this is a decrease in product of 4,018 short tons, or 46.45 per cent, and a decrease in value of \$10,129, or 59.53 per cent.

Mineral Paints—The production of mineral paints in 1909 amounted to 1,635 short tons, valued at \$7,662. As compared with 1908, this is an increase in product of 335 short tons, or 25.77 per cent, and a decrease in value of \$8,438, or 52.41 per cent.

CHEMICAL MATERIALS.

Phosphate rock—The production of phosphate rock in 1909 amounted to 348,841 long tons, valued at \$1,135,574. As compared with 1908, this is a decrease of 66,547

long tons, or 16.02 per cent, and a decrease in value of \$490,316, or 30.15 per cent.

Sulphuric acid—The production of sulphuric acid in 1909, as a by-product in the manufacture of copper, amounted to 66,585 short tons, valued at \$299,483. As compared with 1908, this is an increase in product of 41,585 short tons, or 166.34 per cent, and an increase in value of \$148,483, or 98.33 per cent.

MISCELLANEOUS.

Mineral Waters—The production of mineral waters in 1909 amounted to 989,177 gallons, valued at \$72,499. As compared with 1908, this is an increase in product of 287,866 gallons, or 41.04 per cent, and an increase in value of \$11,670, or 19.16 per cent.

Quartz—The production of quartz in 1909 amounted to 83,095 short tons, valued at \$81,557. As compared with 1908, this is a decrease in product of 1,655 short tons, or 2 per cent, and a decrease in value of \$1,643, or 1.97 per cent.

Sand and gravel—The production of sand for molding, building, engine, furnace, and other purposes, and of gravel in 1909, amounted to 590,888 cubic yards of 2,500 pounds each, valued at \$365,216. As compared with 1908, this is an increase in product of 25,563 cubic yards, or 4.52 per cent, and an increase in value of \$75,166, or 25.90 per cent.

In addition to the minerals herein named, there are other important mineral deposits in Tennessee that have never been developed. One of these is

COBALT,

which is found in Hickman, Humphreys and Dickson counties. Mr. Edison sent a representative here to prospect the field in 1907, but no data or information has ever been given the Mining Department in regard to the results of his examination. Another valuable mineral deposit which has been developed to some extent is

FLOURSPAR.

These deposits are located near Rome, in Smith County, and near Baxter, in Putnam County. Unsatisfactory freight rates and adverse trade conditions forced the operators to temporarily suspend operations in 1906.

MINING LAWS.

The existing mining laws are giving general satisfaction to miners and operators.

Many improvements have been made and new mining equipment and machinery installed by commercial operators reported active during the year.

The department has exercised every precaution to avoid accidents and explosions by placing many of the mines under special rules, restricting the charge of powder and quantity of powder taken into the mines, number of shots, time of firing, kind of tamping used, the employment of skilled men as shot firers, and the employment of gas bosses and inspectors, whose duty requires them to inspect the mines before the miners are allowed to enter. These rules and regulations have been formulated as a necessary supplement to the mining law, facilitating a full compliance with its provisions, and reducing the possibility of mine explosions to a minimum.

ACKNOWLEDGMENTS.

It would be impossible to present a report in such detail as this without the full co-operation of the individual operators and the officials of the operating companies, who not only furnished the product and other data called for in the schedules, but who replied promptly to special inquiries incident thereto, therefore the department extends to them its sincere appreciation.

Acknowledgments are due to the mine foremen, who have complied with the mining laws, as well as to quite a large number of miners, for co-operation with the mine inspectors in complying with the requirements of special rules formulated for their protection in the management of the mines.

Acknowledgments are also due Mr. Frederick L. Hoffman, expert statistician of Newark, N. J., for extracts from an ably edited article upon mining accidents in the United States and Canada, published in the Engineering and Mining Journal of New York City.

Acknowledgments are also due the Chief of the Division of Mines and Mineral Resources, and other officials of the United States Geological Survey for valuable statistical extracts pertaining to the production of such minerals of the United States and of the world as are herein embraced, and to the Bureau of Statistics in the Department of Commerce and Labor for all data pertaining to the exports and imports of the various products herein reviewed.

Special acknowledgments are due District Mine Inspectors L. O. Stone and A. W. Evans, and District Mine Inspector and Statistician J. W. Allen, and R. H. Bartlett, clerk, for the comprehensive and efficient manner in which they have performed their respective duties.

BRIEF STATISTICS, 1909.

The following statement gives brief statistics of all operations in Tennessee engaged in mining, or the reduction of mineral products in 1909:

Brief statistics, 1909.

PRODUCT	Quantity	Value	Total Number of Employes	Average Wages Paid Per Day	Total Amount Paid for Labor
Barytes (short tons) -----	4, 631	\$ 6, 946	20	\$ 1. 00	\$ 4, 700
Brick and tile -----		1, 181, 043	1, 939	1. 10	521, 085
Cement (bbls) -----	600, 000	480, 000	250	1. 50	175, 000
Clay (short tons) -----	43, 961	85, 036	183	1. 30	44, 317
Coal (short tons) -----	6, 207, 483	6, 757, 824	10, 946	2. 12	4, 623, 525
Coke (short tons) -----	262, 750	669, 547	406	1. 20	78, 652
Copper (pounds) -----	19, 083, 099	2, 389, 984	728	2. 22	472, 973
Gas, gas-coke, tar and ammonia -----		991, 991	367	1. 60	191, 556
Gold (fine ounces) -----	281	5, 623	a	a	a
Iron ore (long tons) -----	648, 825	935, 963	1, 626	1. 45	575, 781
Iron, pig (long tons) -----	330, 611	4, 473, 739	1, 393	1. 41	450, 312
Lime (short tons) -----	84, 394	269, 512	378	1. 20	90, 137
Limestone (short tons) -----	904, 177	600, 190	1, 647	1. 33	404, 633
Marble (cubic feet) -----	334, 274	590, 585	848	1. 40	306, 387
Mineral paints (short tons) -----	1, 635	7, 662	26	1. 80	5, 692
Mineral waters (gallons sold) -----	989, 177	72, 499			
Phosphate rock (long tons) -----	348, 841	1, 135, 574	1, 953	1. 17	509, 513
Pottery -----		86, 190	117	1. 35	15, 880
Quartz, (Crystalline,) (short tons) -----	83, 095	81, 557	59	2. 20	40, 671
Sand and Gravel (cubic yards 2500 lbs) -----	590, 888	365, 216	311	1. 42	110, 236
Sandstone (short tons) -----	734	1, 475	4	1. 30	800
Silver (fine ounces) -----	124, 262	62, 347	a	a	a
Sulphuric acid (short tons) -----	66, 585	299, 483	a	a	a
Zinc (pounds) -----	1, 573, 076	115, 969	159	1. 31	37, 355
Total -----		\$ 21, 665, 955	23, 360	\$ 1. 72	\$ 8, 659, 205

a Included in copper statistics.

There are some duplication of values in the above figures that should be excluded.

Pig iron is manufactured from coke, iron ore and limestone, therefore the value of these minerals used in pig iron manufacture should be deducted from total pig iron value, for the reason that the value of said minerals are either embraced in the value of coke, iron ore or limestone reported herein as being produced in Tennessee, or is the value of the product of other States and can not be properly included as a part of the value of the mineral product of Tennessee.

The clay mined in Tennessee to be sold by commercial operators is principally consumed in foreign States, but the value of that clay mined and sold to be used in Tennessee in the manufacture of brick, tiling, or pottery, should be deducted from the total value of clay mined, because its value is embraced in that of brick, tiling and pottery or other manufactured clay product herein reported.

The cost of coal coked is credited to coal values, and should therefore be deducted from coke values.

The value of all coal, oil, or other minerals used in the manufacture of gas, gas-house coke, tar and ammonia, should be deducted from the total value of these products, for the reason that their values are either included in the values of coal, oil, or other mineral reported herein, as having been produced in Tennessee, or is the product of other States, and can not be properly included as a part of the value of the mineral product of Tennessee.

From copper should be deducted the value of coke, limestone, crystalline quartz, or other minerals used in its manufacture, because it is either the value of the product of other States or included in other values of the mineral product of Tennessee herein given.

These duplication of values are as follows:

From clay products:

Value of Clay mined and sold to be manufactured in Tennessee.....	\$ 12,406
---	-----------

From coke:

Coal used, 507,359 short tons, valued at	542,655
--	---------

From copper:

Coke and all minerals used	412,167
----------------------------------	---------

From gas, gashouse coke, tar and ammonia:

All minerals used	221,424
-------------------------	---------

From pig iron:

Coke.....	1,729,278
Iron Ore	1,392,889
Limestone (flux)	148,316
Other minerals	25,360

Total deductions to be made from Pig Iron	\$3,295,843
---	-------------

Total deductions of duplicate values, all products.....	\$4,484,495
---	-------------

With the elimination of the duplicated values given above, the total net value of all clay mined and sold amounts to \$72,630; the total net value of all clay products amounts to \$1,339,863; the total net value of coke amounts to \$126,892; the total net value of copper amounts to \$1,977,817; the total net value of gas and by-products amount to \$770,567; the total net value of pig iron amounts to \$1,177,896, and the total net value of all mineral products in Tennessee in 1909 amounts to \$17,181,460.

BRIEF STATISTICS IN DETAIL AS TO COAL.

The following figures give brief statistics in *detail* as to coal in Tennessee in 1909:

Employees:

Average number inside	9,577
Average number outside	1,369
<hr/>	
Total average number of employees in and around mines.....	10,946
Average wages paid per day	\$ 2.12
Total amount paid for labor	\$4,823,525
Total average number of days active	207

Product (short tons):

First District	1,348,545
Second District	1,104,546
Third District	3,754,392
<hr/>	
Total product	6,207,483

Value of product:

First District	\$1,541,185
Second District	1,205,759
Third District	4,010,880
<hr/>	
Total value of product	\$6,757,824
Average value per ton of product	\$ 1.09
Net increase in product as compared with 1908 (short tons).....	124,632
Net decrease in value as compared with 1908	\$ 203,569

Draft animals employed:

Inside	994
Outside	238
<hr/>	
Total number of draft animals	1,232

Explosives used:

Powder (number of kegs)	120,603
Dynamite (number of pounds)	181,867
Mine cars in use	15,833

Mining machines in use:

Pick	143
Chain breast	40
<hr/>	
Total number of mining machines in use.....	183
Quantity of coal mined with machines (short tons)	963,408

Improvements made:

Value of inside improvements	\$ 73,912
Value of outside improvements	117,866
<hr/>	
Total value of all improvements made	\$ 191,778

Strikes and suspensions:

Total number of days lost	4,326
Total wages lost to employees	\$ 9,171
Total loss in coal product (short tons)	11,853
Total loss in coal values	\$ 12,920

Accidents, number of:

Fatal	31
Non-fatal	197
Total number of children rendered fatherless	32
Total number of wives made widows	18

COAL

The coal areas of the United States are divided into two great divisions—anthracite and bituminous.

The anthracite area is practically all in Eastern Pennsylvania, though there are two small areas located in the Rocky Mountain region in Colorado and in New Mexico.

The bituminous and lignite coal fields are scattered widely over the United States, and include an area of 496,000 square miles. Under the present classification, as shown by the report of the Department of Mines and Mineral Resources of the United States Geological Survey, these coal areas are divided into six provinces, as follows:

(1) The Eastern province, which includes all of the bituminous areas of the Appalachian region; the Atlantic Coast region, which includes the Triassic fields, near Richmond; the Deep and Dan rivers' fields, in North Carolina, and the anthracite region of Pennsylvania.

(2) The Gulf province, which includes the lignite fields of Alabama, Mississippi, Louisiana, Arkansas and Texas.

(3) The Interior province, which includes all of the bituminous areas of the Mississippi Valley region and the coal fields of Michigan. This province is subdivided into the Eastern, Western, Northwestern and Northern regions. The Eastern region embraces the coal fields of Illinois, Indiana and Western Kentucky. The Western region embraces the coal fields of Iowa, Missouri, Nebraska, Kansas, Arkansas and Oklahoma. The Southwestern region embraces the coal fields of Texas, and the Northern region embraces the coal fields of Michigan.

(4) The Northern or Great Plains province, which includes the lignite areas of North and South Dakota, and the bituminous and sub-bituminous areas of Northeastern Wyoming and Northern and Eastern Montana.

(5) The Rocky Mountain province, which includes the coal fields of the mountainous districts of Montana and Wyoming, and all of the coal fields of Utah, Colorado and New Mexico.

(6) The Pacific Coast province, which includes all of the coal fields of California, Oregon and Washington.

The coal areas of Tennessee are embraced in the Appalachian region of the Eastern province, which extends from New York on the north to Alabama on the south, having a length northeast and southwest of more than 900 miles, and a width ranging from 30 to 180 miles. This region embraces the coal fields of Pennsylvania, Ohio, Maryland, Virginia, West Virginia, Eastern Kentucky, Tennessee, Georgia and Alabama, having a combined area of 70,807 square miles underland with coal, which in 1908 produced 299,767,917 short tons, or 72.09 per cent of the total bituminous coal product of the United States.

The coal fields of Tennessee, embracing an approximate area of 4,400 square miles, is divided into three coal districts. The first district comprises the counties of Bledsoe, Cumberland, Fentress, Franklin, Grundy, Marion, Overton, Putnam, Sequatchie, Van Buren and White. The second district comprises the counties of Hamilton, Morgan, Rhea, Roane and Scott, and the third district embraces the counties of Anderson, Campbell and Claiborne. The estimated original coal contents in this area amounted to 25,665,000,000 short tons. Deducting the estimated total exhaustion to close of 1908, amounting to 135,000,000 short tons, there is left 25,530,000,000 short tons as the estimated available supply January 1, 1909, or 99.5 per cent of the estimated original supply.

COAL PRODUCT.

The coal product of Tennessee in 1909 amounted to 6,207,483 short tons, valued at \$6,757,824, or \$1.09 per ton. As compared with 1908, this is an increase in product

of 124,632 short tons, or 2.5 per cent, and a decrease in value of \$203,569 or 2.92 per cent. In the first district there was a decrease in product of 83,414 short tons, and a decrease in values of \$141,141. In the second district there was an increase in product of 57,223 short tons, but a decrease in values of \$24,418. In the third district there was an increase in product of 124,632 short tons, but a decrease in values of \$203,569.

Increases as to product occurred in the counties of Cumberland, Marion, Overton, Sequatchie, Hamilton, Roane, Scott, Campbell and Claiborne. Increases in values occurred in the same counties, except that Campbell County decreased \$74,161. The most important increases in product and values occurred in Hamilton and Claiborne counties, while the most important decreases in values occurred in the counties of Grundy, Morgan and Anderson.

Coal product as herein treated embraces the coal marketed by shipment to distant points, amounting to 5,520,574 short tons, or 88.93 per cent of total product; coal used for fuel and steam amounting to 134,548 short tons, or 2.17 per cent of total product; coal sold to local trade and employes amounting to 47,457 short tons, or .76 per cent of total product; and coal coked amounting to 504,904 short tons, or 8.14 per cent of total product. There was an average of 58,561 short tons of coal produced for each operating plant, and 39,041 short tons of coal produced for each mine reported active.

COAL MINED BY MACHINES.

In 1909 there were 183 mining machines in use in Tennessee. There were 24 firms using machines at 26 different mines, and there were 963,408 short tons of coal, or 15.52 per cent of total product mined with machines. As compared with 1908, this is an increase of total machines in use of six, an increase of one firm using machines, an increase of 104,045 short tons of coal mined with machines, and an increase in percentage of coal mined with machines of 1.4 per cent. Of the one hundred and eighty-three mining machines in use, thirty-one are in the first district, 17 in the second district, and 135 in the third district; 45 are pick Harrison, 79 are pick Ingersoll-Sargent, 17 are pick Sullivan, 2 are pick (other kinds), 12 are chainbreast Jeffrey-electric, 19 are chain breast Sullivan, 5 are chainbreast Goodman, and 4 are chain breast Morgan-Gardner. There were 5,264 short tons of coal produced for each mining machine in use. The earliest record of coal mined by machines in Tennessee was in 1898. The coal mined by machines during that year amounted to 152,002 short tons, or 5.3 per cent of total coal product. An examination of the table of statistics in reference to the mining machines in use during the year will show that more than 75 per cent of the total coal mined by machines was produced in the third district, comprising the counties of Anderson, Campbell and Claiborne, while more than 40 per cent of the coal mined by machines was produced in the county of Campbell alone.

The total machine-mined coal tonnage for the United States in 1908 amounted to 123,183,334 short tons or 37.52 per cent of total coal product, which is an increase in percentage of machine-mined product to the total production, of 1.81 per cent. The total number of mining machines in use in the United States increased from 11,144, in 1907, to 11,569 in 1908. The percentage of coal product mined with machines in 1908, to total coal product, is as follows: Ohio (the highest in rank), 75.37 per cent; Kentucky, 51.27 per cent; Pennsylvania, 44.76 per cent; Indiana, 42.99 per cent; West Virginia, 39.75 per cent; Montana, 37.14 per cent; North Dakota, 32.70 per cent; Illinois, 31.57 per cent; Michigan, 29.18 per cent; Virginia, 24.32 per cent; Wyoming, 19.54 per cent; Colorado, 17.32 per cent; Alabama, 15.37 per cent; and Tennessee, (fourteenth in rank), 12.70 per cent.

LABOR.

The cost of labor in the production of coal, and placing it upon the market prior to 1908, was only given as a whole by districts. Since then it has been given more in detail, and shows the total amount paid to each class of employes by districts.

Amount paid each class of coal employes in Tennessee in 1909 by districts.

KIND OF EMPLOYES	FIRST DISTRICT		SECOND DISTRICT		THIRD DISTRICT		TOTAL	
	Total Amount Paid	Per Cent of Total Cost	Total Amount Paid	Per Cent of Total Cost	Total Amount Paid	Per Cent of Total Cost	Total Amount Paid	Per Cent of Total Cost
Pick miners.....	\$ 728, 075	66.28	\$481, 864	63.44	\$1, 538, 193	55.62	\$2, 748, 132	59.44
Haulage men.....	74, 786	6.81	65, 847	8.67	293, 594	10.62	434, 227	9.39
Foremen.....	24, 049	2.20	21, 357	2.81	68, 728	2.48	114, 134	2.47
Machine miners.....	42, 064	3.83	22, 510	2.96	283, 508	10.25	348, 082	7.53
Machine runners and helpers.....	20, 926	1.91	7, 095	.93	71, 750	2.60	99, 771	2.16
Others inside.....	69, 317	6.31	83, 176	10.95	188, 573	6.82	341, 066	7.37
Total inside.....	\$ 959, 217	87.34	\$681, 849	89.76	\$2, 444, 346	88.39	\$4, 085, 412	88.36
Blacksmiths.....	16, 249	1.48	8, 197	1.08	35, 471	1.28	59, 917	1.30
Timbermen.....	14, 537	1.30	12, 485	1.65	55, 377	2.00	82, 399	1.78
Others outside.....	108, 483	9.88	57, 034	7.51	230, 280	8.33	395, 797	8.56
Total outside.....	\$ 139, 269	12.66	\$ 77, 716	10.24	\$ 321, 128	11.61	\$ 538, 113	11.64
Grand total inside and outside.....	\$1, 098, 486	100.00	\$759, 565	100.00	\$2, 765, 474	100.00	\$4, 623, 525	100.00

As compared with 1908, this is an increase of \$115,450, or 2.54 per cent. There is also a corresponding increase in total coal values. The average rate per day for all workers, inside and outside, excluding those on coke ovens, amounted to \$2.12, as against \$2.14 for 1908. Coal values also decreased from \$1.14 to \$1.09 per ton. For more specific details as to wages paid per day to all employes, reference is made to the special table of statistics, showing wages paid all coal mine employes, and also to the wage scales printed elsewhere in the report.

LABOR TROUBLES.

There was practically no interruption to mining operations in 1909 on account of labor disaffection. There were no controversies of serious import between employer and employes, and the formerly vexed question of strikes or suspensions incident to wage scale adjustments seems to be practically eliminated from the coal mine industry of Tennessee. The miners have long since realized that an amicable adjustment of wage scale was the most profitable, and whatever idleness the mining industry has suffered during the year, other than from suspensions due to adverse trade conditions or financial depression, was, with but one exception, due to peaceful suspension of operations pending wage scale adjustment. This is a gratifying state of affairs, and both miner and operator should be congratulated upon the existence of such conditions.

The total loss on account of strikes amounted to 4,326 days; total loss in wages to employes amounted to \$9,171; total loss in coal product amounted to 11,853 short tons; and total loss in coal values amounted to \$12,920.

NEW DEVELOPMENT.

There was but little new development during the year, though there was an increased expenditure for improvements. A number of fans were installed, which were necessary to properly ventilate the mines; and all monthly reports, required by Section 24 of the mining code, to be made to the Department, are required to give air readings and to affirmatively show that the ventilating current is sufficient for the miners and animals employed in each of the many headings worked for each week. Adequate ventilation is not only conducive to the health and life of the miner, but in a large measure reduces the possibility of gas explosions.

EXPORTS AND IMPORTS IN 1909.

The imports of coal entered for consumption in the United States in 1909 amounted to 4,709 short tons of anthracite, valued at \$19,438, and 1,257,629 short tons of bituminous, valued at \$3,597,991

The exports of coal amounted to 2,842,714 short tons of anthracite, valued at \$14,141,468, and 9,693,843 short tons of bituminous, valued at \$24,300,050. Anthracite coal is admitted free, while the bituminous pays duty.

FINANCIAL STATEMENT

The following is a statement of all revenues and fees accruing to the State by virtue of the provisions of the mining laws, and of all disbursements, during 1909 by months, accounts, and amounts.

Total amount accruing to the State on account of mine inspections.....\$3,725 00
Total amount accruing to the State on account of mine foreman examinations. 370 00

Total revenue.....\$4,095 00

Total disbursements from January 1, 1909, to December 31, 1909, inclusive.

ACCOUNTS	MONTHS						
	Jan.	Feb.	March	April	May	June	July
Salaries:							
Chief Mine Inspector	\$200.00	\$200.00	\$200.00	\$ 200.00	\$ 200.00	\$200.00	\$ 200.00
Dist. Inspector, East Div. .	141.66	141.66	141.66	141.66	141.66	141.66	141.66
Dist. Inspector, Middle Div.	141.66	141.66	141.66	141.66	141.66	141.66	141.66
Dist. Inspector & Statistician	141.66	141.66	141.66	141.66	141.66	141.66	141.66
Clerk	100.00	100.00	100.00	100.00	159.15	125.00	125.00
Traveling Expenses:							
Chief Mine Inspector	71.40	133.57	93.10	54.50	109.65	45.65	92.85
Dist. Inspector, East Div. .	47.15	59.95	42.05	45.25	48.90	63.85	47.20
Dist. Inspector, Middle Div.	44.55	38.05	68.30	45.87	44.66	41.66	50.10
Dist. Inspector & Statistician	9.15	-----	14.25	-----	24.35	-----	-----
Office expenses, sta., blanks, etc	18.25	24.20	30.05	133.17	16.75	55.40	25.10
Postage	5.00	2.80	25.00	84.00	49.00	-----	60.00
Mine Inspectors Supplies	5.60	11.05	13.50	-----	-----	-----	1.00
Printing	-----	-----	-----	494.16	-----	-----	-----
Mine Foreman Examinations	-----	-----	53.42	-----	-----	-----	-----
Total	\$926.08	\$995.20	\$ 1064.65	\$ 1581.93	\$ 1077.44	\$956.54	\$ 1026.23

ACCOUNTS	MONTHS					GRAND TOTAL
	Aug.	Sept.	Oct.	Nov.	Dec.	
Salaries:						
Chief Mine Inspector	\$ 200.00	\$200.00	\$ 200.00	\$200.00	\$ 200.00	\$ 2400.00
District Inspector, East Division ..	141.66	141.66	141.66	141.66	141.66	1699.92
District Inspector Middle Division	141.66	141.66	141.66	141.66	141.66	1699.92
District Inspector & Statistician ..	141.66	141.66	141.66	141.66	141.66	1699.92
Clerk	125.00	125.00	125.00	125.00	125.00	1434.15
Traveling Expenses:						
Chief Mine Inspector	63.30	62.87	87.12	69.50	96.60	980.11
District Inspector, East Division ..	56.43	32.70	61.95	36.95	42.90	585.28
District Inspector Middle Division	32.25	39.60	72.95	37.50	71.50	586.99
District Inspector and Statistician	29.50	14.95	-----	-----	-----	92.20
Office expenses, sta., blanks, etc	24.55	97.50	74.45	54.55	44.67	598.64
Postage	-----	-----	10.00	1.50	81.00	318.30
Mine Inspectors Supplies	33.00	-----	-----	1.50	-----	66.25
Printing	569.10	-----	-----	-----	-----	1063.26
Mine Foreman Examinations	-----	-----	10.00	-----	-----	63.42
Total	\$ 1558.11	\$997.60	\$ 1066.45	\$951.48	\$ 1086.65	\$13,288.36

MINE INSPECTIONS IN 1909, IN DETAIL

The following table shows all mine inspections in 1909 in detail, giving fees due the State from each operator as provided by law:

Mine inspections in 1909 in detail

OPERATORS		MINES		FEE	TOTAL FEES
COUNTY AND NAME	POSTOFFICE	NAME	DATE INSPECTED		
Bledsoe County					
Atpontly Coal Co.-----	Atpontly-----	Atpontly 5-----	Jan. 12-----	\$ 20.00	
Atpontly Coal Co.-----	Atpontly-----	Atpontly 6-----	Jan. 12-----	10.00	\$ 30.00
Cumberland County					
Clear Creek Coal Co.-----	Isoline-----	Clear Creek 5-----	March 29-----	25.00	
Clear Creek Coal Co.-----	Isoline-----	Clear Creek 5-----	Sept. 17-----	25.00	50.00
Fentress County					
Fentress Coal & Coke Co.-----	Wilder-----	Fentress 1-----	Feb. 17-----	30.00	
Fentress Coal & Coke Co.-----	Wilder-----	Fentress 1-----	April 27-----	25.00	
Fentress Coal & Coke Co.-----	Wilder-----	Fentress 1-----	Sept. 7-----	30.00	85.00
Grundy County					
Flat Branch Coal Co.-----	Meeks-----	Flat Branch-----	May 3-----	10.00	
Flat Branch Coal Co.-----	Meeks-----	Flat Branch-----	May 3-----	15.00	25.00
Nunly Ridge Coal Co.-----	Tracy City-----	Roddy Springs-----	May 5-----	20.00	20.00
John Partain-----	Tracy City-----	East Fork-----	May 4-----	20.00	20.00
Sewanee Fuel & Iron Co.-----	Coalmont-----	Clouse Hill-----	May 4-----	15.00	
Sewanee Fuel & Iron Co.-----	Coalmont-----	Coalmont O-----	May 3-----	35.00	50.00
Tenn. Con. Coal Co.-----	Tracy City-----	Ramsey-----	May 4-----	25.00	
Tenn. Con. Coal Co.-----	Tracy City-----	Ramsey west-----	May 5-----	10.00	
Tenn. Con. Coal Co.-----	Tracy City-----	Reid Hill-----	April 23-----	35.00	
Tenn. Con. Coal Co.-----	Tracy City-----	Reid Hill-----	May 4-----	35.00	
Tenn. Con. Coal Co.-----	Tracy City-----	Street Hill-----	May 15-----	15.00	120.00
Marion County					
Battle Creek Coal & C. Co.-----	Orme-----	Battle Creek-----	Jan. 14-----	35.00	
Battle Creek Coal & C. Co.-----	Orme-----	Battle Creek-----	April 14-----	35.00	
Battle Creek Coal & C. Co.-----	Orme-----	Battle Creek-----	Aug. 17-----	25.00	
Battle Creek Coal & C. Co.-----	Orme-----	Battle Creek (new)-----	Aug. 17-----	20.00	115.00
New Etna Coal Co.-----	Chattanooga-----	New Etna 1-----	April 13-----	25.00	25.00
Nunly Ridge Coal Co.-----	Tracy City-----	Pryor Ridge-----	April 22-----	25.00	25.00
Tenn. Coal, I. & R. R. Co.-----	Birmingham, Ala.-----	Thomas 1-2-----	April 16-----	35.00	
Tenn. Coal, I. & R. R. Co.-----	Birmingham, Ala.-----	Thomas 1-2-----	Aug. 31-----	35.00	
Tenn. Coal, I. & R. R. Co.-----	Birmingham, Ala.-----	Thomas 5-----	Aug. 31-----	35.00	105.00
Overton County					
Brier Hill Collieries-----	Crawford-----	Brier Hill 1-----	Feb. 16-----	15.00	
Brier Hill Collieries-----	Crawford-----	Brier Hill 1-----	April 27-----	20.00	
Brier Hill Collieries-----	Crawford-----	Brier Hill 1-----	Sept. 7-----	20.00	
Brier Hill Collieries-----	Crawford-----	Brier Hill 2-----	Feb. 16-----	15.00	
Brier Hill Collieries-----	Crawford-----	Brier Hill 2-----	Sept. 7-----	20.00	90.00
Obey City Coal Co.-----	Obey City-----	Obey City 1-----	Feb. 18-----	15.00	15.00
White County					
Bon Air Coal & Iron Co.-----	Nashville-----	Bon Air Shaft 1-----	June 23-----	35.00	
Bon Air Coal & Iron Co.-----	Nashville-----	Bon Air Shaft 2-----	June 23-----	10.00	
Bon Air Coal & Iron Co.-----	Nashville-----	Bon Air 6-----	June 23-----	35.00	
Bon Air Coal & Iron Co.-----	Nashville-----	Eastland 1-----	June 24-----	20.00	
Bon Air Coal & Iron Co.-----	Nashville-----	Eastland 1-Ex.-----	June 24-----	15.00	
Bon Air Coal & Iron Co.-----	Nashville-----	Eastland 2-----	June 24-----	15.00	130.00
Clifty Creek Coal Co.-----	Clifty-----	Clifty Creek 1-----	July 7-----	25.00	
Clifty Creek Coal Co.-----	Clifty-----	Clifty Creek 3-----	July 7-----	25.00	50.00
Total First District-----				\$ 955.00	\$ 955.00

Mine inspections in 1909 in detail—continued.

OPERATORS		MINES		FEE	TOTAL FEES
COUNTY AND NAME	POSTOFFICE	NAME	DATE INSPECTED		
Hamilton County					
Montlake Coal Co.-----	Chattanooga-----	Montlake 4-----	Jan. 11-----	\$ 25.00	
Montlake Coal Co.-----	Chattanooga-----	Montlake 4-----	May 18-----	25.00	
Montlake Coal Co.-----	Chattanooga-----	Montlake 4-----	Aug. 19-----	20.00	
Montlake Coal Co.-----	Chattanooga-----	Montlake 5-----	Aug. 19-----	5.00	\$ 75.00
New Soddy Coal Co.-----	Chattanooga-----	New Soddy 1-----	Jan. 27-----	35.00	
New Soddy Coal Co.-----	Chattanooga-----	New Soddy 1-----	May 17-----	35.00	
New Soddy Coal Co.-----	Chattanooga-----	New Soddy 1-----	Aug. 18-----	35.00	105.00
Morgan County					
Big Brushy Coal & C. Co.-----	Petros-----	Big Brushy 2-----	June 8-----	20.00	
Big Brushy Coal & C. Co.-----	Petros-----	Big Brushy 2-----	Oct. 5-----	25.00	45.00
Big Mt. Coal Co.-----	Oliver Springs-----	Big Mt.-----	May 5-----	5.00	
Big Mt. Coal Co.-----	Oliver Springs-----	Big Mt.-----	Nov. 22-----	15.00	20.00
Blue Ridge Coal Co.-----	Oliver Springs-----	Blue Ridge-----	May 5-----	5.00	5.00
Bowling Coal Co.-----	Coalfield-----	Bowling 1-----	Jan. 22-----	25.00	
Bowling Coal Co.-----	Coalfield-----	Bowling 1-----	May 31-----	25.00	
Bowling Coal Co.-----	Coalfield-----	Bowling 1-----	Aug. 10-----	15.00	
Bowling Coal Co.-----	Coalfield-----	Bowling 1-----	Nov. 8-----	20.00	
Bowling Coal Co.-----	Coalfield-----	Bowling 2-----	May 31-----	15.00	100.00
Butler Coal Mining Co.-----	Oliver Springs-----	Butler 2-----	May 4-----	15.00	15.00
Harriman Coal Co.-----	Harriman-----	Harriman 3-----	Feb. 4-----	5.00	
Harriman Coal Co.-----	Harriman-----	Harriman 3-----	Oct. 4-----	5.00	10.00
Little Brushy Coal Co.-----	Coalfield-----	Little Brushy-----	June 14-----	15.00	15.00
Poplar Creek Coal Co.-----	Oliver Springs-----	Poplar Creek-----	May 5-----	15.00	
Poplar Creek Coal Co.-----	Oliver Springs-----	Poplar Creek-----	Oct. 22-----	15.00	30.00
Prudential Coal Co.-----	Oliver Springs-----	Prudential-----	May 4-----	15.00	
Prudential Coal Co.-----	Oliver Springs-----	Prudential-----	Nov. 8-----	20.00	35.00
State of Tennessee-----	Nashville-----	Brushy Mt. 1-----	Jan. 20-----	25.00	
State of Tennessee-----	Nashville-----	Brushy Mt. 1-----	May 21-----	20.00	
State of Tennessee-----	Nashville-----	Brushy Mt. 1-----	Nov. 30-----	25.00	
State of Tennessee-----	Nashville-----	Brushy Mt. 3-----	Jan. 19-----	35.00	
State of Tennessee-----	Nashville-----	Brushy Mt. 3-----	Feb. 26-----	\$ None.	
State of Tennessee-----	Nashville-----	Brushy Mt. 3-----	May 21-----	35.00	
State of Tennessee-----	Nashville-----	Brushy Mt. 3-----	Aug. 6-----	35.00	
State of Tennessee-----	Nashville-----	Brushy Mt. 3-----	Nov. 23-----	35.00	
State of Tennessee-----	Nashville-----	Brushy Mt. 3-----	Dec. 1-----	None.	210.00
Rhea County					
Dayton Coal & Iron Co.-----	Dayton-----	New Prospect-----	Aug. 12-----	15.00	
Dayton Coal & Iron Co.-----	Dayton-----	New Prospect-----	Oct. 16-----	25.00	
Dayton Coal & Iron Co.-----	Dayton-----	Richland 13-14-----	April 29-----	35.00	
Dayton Coal & Iron Co.-----	Dayton-----	Richland 13-14-----	Aug. 12-----	35.00	110.00
Roane County					
Roane Iron Co.-----	Rockwood-----	Old-----	April 7-9-----	35.00	
Roane Iron Co.-----	Rockwood-----	Old-----	Aug. 2-3-----	35.00	70.00
Scott County					
Glen Mary Coal & C. Co.-----	Glen Mary-----	Glen Mary 2-4-----	Feb. 10-----	25.00	
Glen Mary Coal & C. Co.-----	Glen Mary-----	Glen Mary 5-----	Feb. 10-----	25.00	50.00
Pine Knot Coal Co.-----	Harriman-----	Jakes Branch-----	Feb. 4-----	15.00	15.00
Southern Clay Mfg. Co.-----	Chattanooga-----	Southern Clay-----	Feb. 11-----	5.00	5.00
Total Second District-----				\$ 915.00	\$ 915.00
Anderson County					
Black Diamond Coal Co.-----	Knoxville-----	Black Diamond-----	June 10-----	35.00	
Black Diamond Coal Co.-----	Knoxville-----	Black Diamond-----	Aug. 12-----	25.00	\$ 60.00
Coal Creek Coal Co.-----	Coal Creek-----	Fraterville-----	May 14-----	30.00	
Coal Creek Coal Co.-----	Coal Creek-----	Thistle 1-----	Jan. 12-----	25.00	85.00
Coal Creek Coal Co.-----	Coal Creek-----	Thistle 1-----	May 13-----	30.00	
Knoxville Iron Co.-----	Knoxville-----	Cross Mt. 1-----	June 14-----	35.00	35.00

Mine inspections in 1909 in detail—continued.

OPERATORS		MINES		FEE	TOTAL FEES
COUNTY AND NAME	POSTOFFICE	NAME	DATE INSPECTED		
Anderson County—Con.					
Royal Coal & Coke Co	Knoxville	Brookside	Jan. 11	25.00	
Royal Coal & Coke Co	Knoxville	Buck Mt.	Jan. 11	20.00	
Royal Coal & Coke Co	Knoxville	Buck Mt.	Sept. 15	25.00	
Royal Coal & Coke Co	Knoxville	Eureka	Jan. 11	20.00	90.00
Tennessee Coal Co	Knoxville	Tennessee 1	Jan. 8	25.00	
Tennessee Coal Co	Knoxville	Tennessee 1	July 26	25.00	
Tennessee Coal Co	Knoxville	Tennessee 2	Jan. 8	30.00	
Tennessee Coal Co	Knoxville	Tennessee 2	July 26	20.00	100.00
Windrock Coal Co	Windrock	Windrock 1	May 6	35.00	
Windrock Coal Co	Windrock	Windrock 1	Nov. 23	35.00	70.00
Campbell County					
Bear Wallow Coal Co	Careyville	Bear Wallow	April 19	15.00	
Bear Wallow Coal Co	Careyville	Bear Wallow	June 16	15.00	
Bear Wallow Coal Co	Careyville	Bear Wallow	Nov. 9	15.00	45.00
Big Block Coal Co	Cupp	Big Block	Sept. 16	15.00	15.00
Block Coal & Coke Co	Block	Block 1	April 28	20.00	
Block Coal & Coke Co	Block	Block 2	April 28	20.00	40.00
Blue Gem Coal Co	Jellico	Blue Gem (Speed)	Oct. 28	25.00	25.00
Campbell Coal Min. Co	Westbourne	Jackson	June 1	35.00	35.00
Careyville Coal Co	Careyville	Careyville	April 26	25.00	25.00
Chaska Coal Co	Chaska	Chaska	May 27	25.00	25.00
Davis Creek Coal Co	Cupp	Davis Creek 1	June 2	15.00	
Davis Creek Coal Co	Cupp	Davis Creek 2	June 3	15.00	30.00
Evans Coal Co	Jellico	Evans	Oct. 27	20.00	20.00
Falls Branch Coal Co	Wooldridge	Falls Branch	July 22	25.00	25.00
Italian B. G. Coal Co	Newcomb	Italian B. G.	July 23	20.00	20.00
Italy Coal Co	Cupp	Italy 1	Sept. 17	10.00	10.00
Jellico B. G. Coal Co	Jellico	Jellico B. G.	Oct. 27	20.00	20.00
Kimberly Coal Co	Cupp	Kimberly	May 27	30.00	
Kimberly Coal Co	Cupp	Kimberly	Aug. 10	30.00	60.00
LaFollette C., I. & Ry. Co	LaFollette	Rex 1	March 8	35.00	
LaFollette C., I. & Ry. Co	LaFollette	Rex 1	June 8	35.00	
LaFollette C., I. & Ry. Co	LaFollette	Rex 1	Oct. 25	35.00	
LaFollette C., I. & Ry. Co	LaFollette	Rex 2	March 9	35.00	
LaFollette C., I. & Ry. Co	LaFollette	Rex 2	June 9	35.00	
LaFollette C., I. & Ry. Co	LaFollette	Rex 2	Oct. 26	35.00	210.00
Morley Coal Co	Morley	Morley	May 11	15.00	15.00
Procter Coal Co	Red Ash, Ky	Indian Mt. 1	July 24	20.00	
Procter Coal Co	Red Ash, Ky	Indian Mt. 2	July 24	20.00	40.00
Red Ash Coal Co	Careyville	Red Ash	April 27	25.00	25.00
Remy Coal Co	Gatliff	Remy	May 28	30.00	30.00
Rich Mt. Coal & C. Co	Bennett	Rich Mt.	June 2	25.00	
Rich Mt. Coal & C. Co	Bennett	Rich Mt.	Aug. 10	20.00	45.00
Royal Coal & Coke Co	Knoxville	Cambria 1	May 12	25.00	
Royal Coal & Coke Co	Knoxville	Cambria 1	Sept. 14	35.00	60.00
Sun Coal Co	Careyville	Sun	Nov. 27	25.00	25.00
Westbourne Coal Co	Westbourne	Westbourne	June 1	25.00	25.00
Wooldridge-Jellico C. Co	Wooldridge	Mary-Anna	July 21	30.00	30.00
Zechini Coal Co	Newcomb	Zechini	July 23	30.00	30.00
Claiborne County					
Bryson Mt. Coal & C. Co	Hartranft	Bryson Mt	Feb. 22	\$ 35.00	\$ 35.00
Fork Ridge Coal & C. Co	Fork Ridge	Fork Ridge (F)	Feb. 23	30.00	
Fork Ridge Coal & C. Co	Fork Ridge	Fork Ridge (F)	Aug. 19	30.00	
Fork Ridge Coal & C. Co	Fork Ridge	Fork Ridge (S)	Feb. 23	30.00	90.00
King Mt. Coal Co	Clairfield	King Mt.	May 10	20.00	20.00

MINING DEPARTMENT OF TENNESSEE.

Mine inspections in 1909 in detail—continued.

OPERATORS		MINES		FEE	TOTAL FEES
COUNTY AND NAME	POSTOFFICE	NAME	DATE INSPECTED		
Claiborne County—Con.					
Nicholson Coal Co -----	Nicholson -----	Nicholson 2 -----	Aug. 17 ---	25.00	
Nicholson Coal Co -----	Nicholson -----	Nicholson 3 -----	Aug. 17 ---	15.00	40.00
Pruden Coal & Coke Co. ---	Pruden -----	Pruden -----	Feb. 4. ---	35.00	35.00
Reliance Coal & C. Co. ---	Hartranft -----	Reliance 1 -----	Feb. 23 ---	15.00	
Reliance Coal & C. Co. ---	Hartranft -----	Reliance 2 -----	Feb. 23 ---	15.00	30.00
Sterling Coal & Coke Co. ---	Manning -----	Sterling 2 -----	Feb. 22 ---	35.00	35.00
Yellow Creek Coal Co. ---	Bosworth, Ky. ---	Yellow Creek 2 -----	Aug. 18 ---	25.00	25.00
Total Third District -----				\$ 1680.00	\$ 1680.00
Total fees due the State from all Coal Mine Inspections in 1909 -----				\$ 3550.00	\$ 3550.00

COPPER MINE INSPECTIONS IN 1909

OPERATORS		MINES		FEE	TOTAL FEES
COUNTY AND NAME	POSTOFFICE	NAME	DATE INSPECTED		
Polk County					
Ducktown Sulphur, Cop- per & Iron Co.	Isabella -----	East Tenn -----	July 16 ---	\$ 10.00	
Ducktown Sulphur, Cop- per & Iron Co.	Isabella -----	Mary -----	July 15 ---	35.00	\$ 45.00
Tennessee Copper Co ---	Copperhill -----	Burra Burra -----	July 14 ---	35.00	
Tennessee Copper Co ---	Copperhill -----	Burra Burra -----	Dec. 2 ---	35.00	
Tennessee Copper Co ---	Copperhill -----	London -----	July 21 ---	30.00	
Tennessee Copper Co ---	Copperhill -----	Polk Co -----	July 15 ---	30.00	130.00
Total fees due the State from all Copper Mine Inspections in 1909 -----				\$ 175.00	\$ 175.00
Grand total fees due the State from all Mine Inspections in 1909 -----				\$ 3725.00	\$ 3725.00

COAL MINES IN TENNESSEE JANUARY 1, 1910

This table gives name and location of coal mines in Tennessee, January 1, 1910, with name and postoffice address of Superintendents arranged alphabetically by counties and mines:

Name and postoffice address of coal mines and superintendents in Tennessee, January 1, 1910.

No.	MINE		No.	SUPERINTENDENT	
	COUNTY AND NAME	POSTOFFICE		COUNTY AND NAME	POSTOFFICE
	<i>Anderson County</i>			<i>Anderson County</i>	
1	Black Diamond 1	Coal Creek	1	L. F. Card	Coal Creek
2	Black Diamond 5	Coal Creek	2	L. F. Card	Coal Creek
3	Black Diamond 6	Briceville	3	John Jeffreys, Sr.	Briceville
4	Brookside	Pless	4	John W. Goans	Pless
5	Buck Mountain	Pless	5	John W. Goans	Pless
6	Campbell 2	Oliver Springs	6	W. H. Stienknecht	Oliver Springs
7	Campbell 3	Oliver Springs	7	W. H. Stienknecht	Oliver Springs
8	Campbell 4	Oliver Springs	8	W. H. Stienknecht	Oliver Springs
9	Cross Mountain 1	Briceville	9	P. F. Lynch	Briceville
10	Cross Mountain 3	Briceville	10	P. F. Lynch	Briceville
11	Eureka 2	Pless	11	John W. Goans	Pless
12	Fraterville 1	Coal Creek	12	G. M. Camp	Coal Creek
13	Middle Ridge	Briceville	13	E. F. Buffat	Briceville
14	Reed	Oliver Springs	14	B. F. Ryan	Oliver Springs
15	Riding	Briceville	15	D. J. Riding	Briceville
16	Taft	Coal Creek	16	G. M. Camp	Coal Creek
17	Tennessee	Briceville	17	E. F. Buffat	Briceville
18	Thistle	Coal Creek	18	G. M. Camp	Coal Creek
19	Windrock	Windrock	19	C. H. Thompson	Windrock
	<i>Bledsoe County</i>			<i>Bledsoe County</i>	
20	Atpontley 1	Atpontley	20	C. B. Finley	Atpontley
21	Atpontley 2	Atpontley	21	C. B. Finley	Atpontley
22	Atpontley 6	Atpontley	22	C. B. Finley	Atpontley
	<i>Campbell County</i>			<i>Campbell County</i>	
23	Anchor	Morley	23	H. W. Smith	Morley
24	Arnetts Lone Mt.	Newcomb	24	C. T. Arnett	Newcomb
25	Baird Blue Gem	Elk Valley	25	Lewis Baird	Elk Valley
26	Bear Wallow	Careyville	26	A. H. Bowling	Oliver Springs
27	Big Block	Cupp	27	J. Goldberg	Cupp
28	Black Gem	Careyville	28	W. F. Park	Knoxville
29	Block 2	Block	29	H. M. Stokes	Block
30	Block 3	Block	30	H. M. Stokes	Block
31	Blue Gem (Speed)	Jellico	31	J. F. Macpherson	Jellico
32	Cambria	Coal Creek	32	G. W. Card	Coal Creek
33	Careyville	Careyville	33	J. H. McManaman	Careyville
34	Chaska	Chaska	34	W. M. Sexton	Chaska
35	Davis Creek 1	Cupp	35	John Zocchi	Cupp
36	Davis Creek 2	Cupp	36	John Zocchi	Cupp
37	Elk Hart, B. G.	Elk Valley	37	A. S. Lindsay	Elk Valley
38	Elk Valley	Elk Valley	38	J. C. Brooks (Rec)	Knoxville
39	Evans	Jellico	39	John P. Gorman	Jellico
40	Falls Branch	Woodridge	40	Wm. Dinkelaker	Woodridge
41	Gem	Peabody	41	Harry Wynn	LaFollette
42	Indian Mt. 1	Jellico	42	Philip Francis	Jellico
43	Indian Mt. 2	Jellico	43	Philip Francis	Jellico
44	Italian, B. G.	Newcomb	44	Thomas Zechini	Newcomb

Coal mines and superintendents in Tennessee, January 1, 1910—continued.

No.	MINE		No.	SUPERINTENDENT	
	COUNTY AND NAME	POSTOFFICE		COUNTY AND NAME	POSTOFFICE
	<i>Campbell County—Con.</i>			<i>Campbell County—Con.</i>	
45	Italy	Cupp	45	P. J. Cross	Cupp
46	Jackson	Westbourne	46	J. D. Cain	Westbourne
47	Jellico, B. G.	Jellico	47	H. M. Jones	Jellico
48	Kimberly	Cupp	48	W. H. Pettus	Cupp
49	Layne	Newcomb	49	M. H. Layne	Newcomb
50	Mary-Anna	Wooldridge	50	William Dinkelaker ..	Wooldridge
51	Morley	Morley	51	J. C. Kranz	Morley
52	Powhattan	Wooldridge	52	William Dinkelaker ..	Wooldridge
53	Red Ash	Careyville	53	T. D. Richards	Careyville
54	Remy	Gatliff	54	J. D. Wheeler	Gatliff
55	Rex 1	LaFollette	55	Harry Wynn	LaFollette
56	Rex 2	LaFollette	56	Harry Wynn	LaFollette
57	Rich Mountain 1 ..	Bennett	57	H. W. Tillery	Bennett
58	Rich Mountain 2 ..	Bennett	58	H. W. Tillery	Bennett
59	Royal (Old)	Coal Creek	59	G. W. Card	Coal Creek
60	Southern 1	Gatliff	60	A. V. Brown	Gatliff
61	Southern 2	Gatliff	61	A. V. Brown	Gatliff
62	Sun	Careyville	62	J. H. Bowling	Careyville
63	Sunshine	Jellico	63	James McReynolds ..	Jellico
64	Tennessee, B. G. ..	Jellico	64	Charles Bradley	Jellico
65	Tenn.-Jellico	Anthrass	65	John P. Gorman	Anthrass
66	Westbourne 1-2	Westbourne	66	N. B. Perkins	Westbourne
67	Westbourne 3	Westbourne	67	N. B. Perkins	Westbourne
68	Whistle Creek	Newcomb	68	H. L. Brummett	Jellico
69	Woodward 2	Jellico	69	C. M. Woodward	Jellico
70	Wooldridge	Wooldridge	70	William Dinkelaker ..	Wooldridge
71	Zechini	Newcomb	71	Thomas Zechini	Newcomb
	<i>Claiborne County</i>			<i>Claiborne County</i>	
72	Bryson Mt. 1	Hartranft	72	A. L. Adam	Hartranft
73	Bryson Mt. 2	Hartranft	73	A. L. Adam	Hartranft
74	Buffalo	Eagan	74	J. M. Parham	Eagan
75	Fork Ridge 1	Fork Ridge	75	A. H. Rennebaum	Fork Ridge
76	Fork Ridge 2	Fork Ridge	76	A. H. Rennebaum	Fork Ridge
77	Fork Ridge 3	Fork Ridge	77	A. H. Rennebaum	Fork Ridge
78	King Mountain	Clairfield	78	William Heath	Clairfield
79	Mingo 1	Hartranft	79	R. L. Ralston	Hartranft
80	Mingo 2	Hartranft	80	R. L. Ralston	Hartranft
81	Mingo 3	Hartranft	81	R. L. Ralston	Hartranft
82	Mingo 5	Hartranft	82	R. L. Ralston	Hartranft
83	New Jellico	Clairfield	83	Richard Rigby	Clairfield
84	Nicholson 2	Nicholson	84	E. R. Short	Nicholson
85	Nicholson 3	Nicholson	85	E. R. Short	Nicholson
86	Pruden 1	Pruden	86	William Buck	Pruden
87	Pruden 2	Pruden	87	William Buck	Pruden
88	Reliance 1-2	Hartranft	88	D. C. Swab	Hartranft
89	Reliance 3	Hartranft	89	D. C. Swab	Hartranft
90	Standard	Clairfield	90	G. T. Spencer	Clairfield
91	Sterling 1-2	Manring	91	W. H. Finley	Manring
92	Yellow Creek 2	Bosworth, Ky.	92	J. F. Bosworth	Bosworth, Ky.
93	Yellow Creek 3	Bosworth, Ky.	93	J. F. Bosworth	Bosworth, Ky.
	<i>Cumberland County</i>			<i>Cumberland County</i>	
94	Clear Creek 1	Isoline	94	J. L. Barr	Isoline
95	Clear Creek 5	Isoline	95	J. L. Barr	Isoline
96	Fall Creek	Ozone	96	W. M. Stewart	Ozone
97	Renfro	Renfro	97	T. W. Gould	Renfro
98	Waldensia	Waldensia	98	D. P. Taylor	Waldensia

Coal mines and superintendents in Tennessee, January 1, 1910—continued.

No.	MINE		No.	SUPERINTENDENTS	
	COUNTY AND NAME	POSTOFFICE		COUNTY AND NAME	POSTOFFICE
	<i>Fentress County</i>			<i>Fentress County</i>	
99	Fentress 1.....	Wilder.....	99	V. R. Evans.....	Wilder
100	Fentress 1.....	Wilder.....	100	V. R. Evans.....	Wilder
	<i>Grundy County</i>			<i>Grundy County</i>	
101	Brushy Ridge.....	Tracy City.....	101	R. B. Roberts.....	Tracy City
102	Chattanooga K.....	Coalmont.....	102	J. R. Ryan.....	Coalmont
103	Clouse Hill 1-2.....	Tracy City.....	103	J. M. Sehorn.....	Coalmont
104	Coalmont A.....	Coalmont.....	104	J. M. Sehorn.....	Coalmont
105	Coalmont B.....	Coalmont.....	105	J. M. Sehorn.....	Coalmont
106	Coalmont H.....	Coalmont.....	106	J. M. Sehorn.....	Coalmont
107	Coalmont O.....	Coalmont.....	107	J. M. Sehorn.....	Coalmont
108	Coalmont Q.....	Coalmont.....	108	J. M. Sehorn.....	Coalmont
109	East Fork.....	Tracy City.....	109	R. B. Roberts.....	Tracy City
110	East Staub.....	Tracy City.....	110	R. B. Roberts.....	Tracy City
111	Flat Branch.....	Meeks.....	111	W. H. Workman.....	Meeks
112	Ramsey 1.....	Tracy City.....	112	R. B. Roberts.....	Tracy City
113	Ramsey West.....	Tracy City.....	113	R. B. Roberts.....	Tracy City
114	Reid Hill 1.....	Tracy City.....	114	R. B. Roberts.....	Tracy City
115	Roddy Springs 1.....	Tracy City.....	115	R. B. Roberts.....	Tracy City
116	Street Hill.....	Tracy City.....	116	R. B. Roberts.....	Tracy City
	<i>Hamilton County</i>			<i>Hamilton County</i>	
117	Big Soddy 1.....	Soddy.....	117	J. H. Jones.....	Soddy
118	Big Soddy 2.....	Soddy.....	118	J. H. Jones.....	Soddy
119	Big Soddy 3.....	Soddy.....	119	J. H. Jones.....	Soddy
120	Big Soddy 4.....	Soddy.....	120	J. H. Jones.....	Soddy
121	Big Soddy A.....	Soddy.....	121	J. H. Jones.....	Soddy
122	Big Soddy B.....	Soddy.....	122	J. H. Jones.....	Soddy
123	Lewis.....	Soddy, r.f.d. 2.....	123	J. S. Lewis.....	Soddy r.f.d. 2
124	Montlake.....	Montlake.....	124	W. E. Brinkerhoff.....	Montlake
125	New Soddy 1-2.....	Soddy.....	125	J. H. Jones.....	Soddy
126	New Soddy 4.....	Soddy.....	126	J. H. Jones.....	Soddy
127	New Soddy 5.....	Soddy.....	127	J. H. Jones.....	Soddy
128	New Soddy 9.....	Soddy.....	128	J. H. Jones.....	Soddy
129	New Soddy 10.....	Soddy.....	129	J. H. Jones.....	Soddy
130	Sale Creek.....	Sale Creek.....	130	J. H. Jones.....	Soddy
	<i>Marion County</i>			<i>Marion County</i>	
131	Battle Creek.....	Orme.....	131	F. P. Thompson.....	Orme
132	New Etna 1.....	Whiteside.....	132	Thomas Degnan.....	Whiteside
133	New Etna 2.....	Whiteside.....	133	Thomas Degnan.....	Whiteside
134	New Etna 3.....	Whiteside.....	134	Thomas Degnan.....	Whiteside
135	New Etna 4.....	Whiteside.....	135	Thomas Degnan.....	Whiteside
136	New Etna 5.....	Whiteside.....	136	Thomas Degnan.....	Whiteside
137	Pryor Ridge.....	Tracy City 7 mi.....	137	R. B. Roberts.....	Tracy City
138	Tenn River.....	South Pittsburg.....	138	G. H. Crozer.....	South Pittsburg
139	Thomas 1-2.....	Whitewell.....	139	J. F. Meagher.....	Whitewell
140	Thomas 5.....	Whitewell.....	140	J. F. Meagher.....	Whitewell
	<i>Morgan County</i>			<i>Morgan County</i>	
141	Babahatchie.....	Oakdale.....	141	W. D. Kelly.....	Rockwood
142	Big Brushy 1-2.....	Petros.....	142	W. S. Wood.....	Petros
143	Big Mountain.....	Oliver Springs.....	143	Sam Craig.....	Oliver Springs
144	Blue Ridge.....	Oliver Springs.....	144	John H. Fritts.....	Oliver Springs
145	Bowling 1.....	Coalfield.....	145	O. S. Bowling.....	Coalfield
146	Bowling 2.....	Coalfield.....	146	O. S. Bowling.....	Coalfield
147	Brushy Mt. 1.....	Petros.....	147	L. A. Carden.....	Petros
148	Brushy Mt. 3.....	Petros.....	148	L. A. Carden.....	Petros
149	Butler 2.....	Oliver Springs.....	149	E. B. Booth.....	Oliver Springs
150	Cow Creek.....	Oliver Springs.....	150	W. S. Mullins.....	Oliver Springs

Coal mines and superintendents in Tennessee, January 1, 1910—continued.

No.	MINE		No.	SUPERINTENDENT	
	COUNTY AND NAME	POSTOFFICE		COUNTY AND NAME	POSTOFFICE
	<i>Morgan County—con.</i>			<i>Morgan County—con.</i>	
151	Dixie.....	Oliver Springs	151	C. C. Liles.....	Oliver Springs
152	Fagan.....	Coalfield r.f.d.	152	J. A. Fagan.....	Coalfield r.f.d.
153	Fairchild.....	Sunbright r.f.d.	153	G. W. Fairchild.....	Sunbright r.f.d.
154	Harriman.....	Harriman	154	E. F. Blizzard.....	Harriman
155	Jackson.....	Oliver Springs	155	Alex Jackson.....	Oliver Springs
156	Little Brushy.....	Coalfield	156	H. B. Bowling, Rec.....	Coalfield
157	Mount Carbon.....	Oliver Springs	157	William Fritts.....	Oliver Springs
158	Oliver.....	Oliver Springs	158	W. D. Richards.....	Oliver Springs
159	Poplar Creek.....	Oliver Springs	159	H. H. Braden.....	Oliver Springs
160	Prudential.....	Oliver Springs	160	J. K. Butler.....	Oliver Springs
	<i>Overtown County</i>			<i>Overtown County</i>	
161	Brier Hill 1.....	Crawford	161	E. B. Taylor.....	Crawford
162	Brier Hill 2.....	Crawford	162	E. B. Taylor.....	Crawford
163	Brier Hill 4.....	Crawford	163	E. B. Taylor.....	Crawford
164	Laurel Creek.....	Wilder	164	G. M. Fritts.....	Wilder
165	Obey City 1.....	Obey City	165	A. D. Eatherly.....	Obey City
166	Peacock 4-5.....	Obey City	166	J. C. Lusk.....	Obey City
	<i>Rhea County</i>			<i>Rhea County</i>	
167	Fox 1.....	Graysville	167	J. H. Jones.....	Soddy
168	Fox 2.....	Graysville	168	J. H. Jones.....	Soddy
169	Fox 3.....	Graysville	169	J. H. Jones.....	Soddy
170	Fox 4.....	Graysville	170	J. H. Jones.....	Soddy
171	New Prospect.....	Dayton	171	Joseph Cain.....	Dayton
172	Richland.....	Dayton	172	Joseph Cain.....	Dayton
173	Spring City.....	Spring City	173	J. C. Dodson.....	Spring City
	<i>Roane County</i>			<i>Roane County</i>	
174	McLean.....	Rockwood	174	W. J. Richards.....	Rockwood
175	Old.....	Rockwood	175	W. J. Richards.....	Rockwood
	<i>Scott County</i>			<i>Scott County</i>	
176	Baker.....	Newland	176	A. McDonald.....	Harriman
177	Glen Mary 2-4.....	Glen Mary	177	Gus Carter.....	Glen Mary
178	Glen Mary 5.....	Glen Mary	178	Gus Carter.....	Glen Mary
179	Lehigh 5.....	Helenwood	179	J. C. Pemberton.....	Helenwood
180	Lehigh 6.....	Helenwood	180	J. C. Pemberton.....	Helenwood
181	LeMoyné.....	Isham	181	J. C. Walker.....	Silversville, Ky.
182	Oneida.....	Oneida	182	M. E. Terry.....	Oneida
183	Paint Rock 1.....	Oneida r.f.d.	183	J. D. Roberts.....	Harriman
184	Paint Rock 2.....	Oneida r.f.d.	184	J. D. Roberts.....	Harriman
185	Paint Rock 3.....	Oneida r.f.d.	185	J. D. Roberts.....	Harriman
186	Pine Knot.....	Laxton	186	Jerry Connor.....	Laxton
187	Robbins, B. G.....	Robbins	187	Jasper Hughett.....	Robbins
188	Southern Clay.....	Robbins	188	R. M. Ashby.....	Robbins
189	Stanley.....	Oneida r.f.d.	189	A. McDonald.....	Harriman
	<i>Sequatchie County</i>			<i>Sequatchie County</i>	
190	Douglass 2.....	Dunlap	190	John M. Smith.....	Dunlap
	<i>White County</i>			<i>White County</i>	
191	Bon Air (Shaft).....	Bon Air	191	W. F. Dibrell.....	Bon Air
192	Bon Air 6.....	Bon Air	192	W. F. Dibrell.....	Bon Air
193	Clifty Creek 1.....	Clifty	193	C. W. Bell.....	Clifty
194	Clifty Creek 2.....	Clifty	194	C. W. Bell.....	Clifty
195	Clifty Creek 3.....	Clifty	195	C. W. Bell.....	Clifty
196	Eastland 1.....	Eastland	196	J. M. Durrett.....	Eastland
197	Eastland 2.....	Eastland	197	J. M. Durrett.....	Eastland
198	Ravenscroft.....	Ravenscroft	198	W. D. Hardeman.....	Ravenscroft

COAL MINE OPERATORS IN TENNESSEE, JANUARY 1, 1910

This table gives name and post office address of all coal mine operators in Tennessee, January 1, 1910, arranged alphabetically by districts, counties and operators, also names and location of mines.

*Name and postoffice address of coal mine operators in Tennessee.
January 1, 1910.*

No.	OPERATOR		No.	MINE	
	COUNTY AND NAME	POSTOFFICE		COUNTY AND NAME	POSTOFFICE
1	<i>Bledsoe County</i>		1	<i>Bledsoe County</i>	
	Atpontley Coal Co.	Atpontley		Atpontley 1	Atpontley
	Atpontley Coal Co.	Atpontley		Atpontley 2	Atpontley
2	<i>Cumberland County</i>		3	<i>Cumberland County</i>	
	Clear Creek Coal & L. Co.	Isoline		Atpontley 6	Atpontley
	Clear Creek Coal & L. Co.	Isoline	4	Clear Creek 1	Isoline
3	Fall Creek Colliers	Ozone		Clear Creek 5	Isoline
	Renfro Coal & Coke Co.	Renfro		Fall Creek	Ozone
4	Waldensia Coal & Coke Co.	Waldensia	7	Renfro	Renfro
	<i>Fentress County</i>			Waldensia	Waldensia
	Fentress Coal & Coke Co.	Wilder	8	<i>Fentress County</i>	
5	Fentress Coal & Coke Co.	Wilder		Fentress 1	Wilder
	<i>Grundy County</i>			Fentress 2	Wilder
6	Chattanooga Mining Co.	Coalmont	11	<i>Grundy County</i>	
	Flat Branch Coal Co.	Meeks		Chattanooga K	Coalmont
	Nunley Ridge Coal Co.	Tracy City		Flat Branch	Meeks
7	Nunley Ridge Coal Co.	Tracy City	12	Brushy Ridge	Tracy City
	Sewanee Fuel & Iron Co.	Coalmont		Roddy Springs	Tracy City
8	Sewanee Fuel & Iron Co.	Coalmont		Clouse Hill 1-2	Tracy City
9	Sewanee Fuel & Iron Co.	Coalmont	13	Coalmont A	Coalmont
	Sewanee Fuel & Iron Co.	Coalmont		Coalmont H	Coalmont
10	Sewanee Fuel & Iron Co.	Coalmont		Coalmont B	Coalmont
	Sewanee Fuel & Iron Co.	Coalmont	14	Coalmont O	Coalmont
	Tenn. Con. Coal Co.	Tracy City		Coalmont Q	Coalmont
11	Tenn. Con. Coal Co.	Tracy City	15	East Fork	Tracy City
	Tenn. Con. Coal Co.	Tracy City		East Staub	Tracy City
12	Tenn. Con. Coal Co.	Tracy City		Ramsey 1	Tracy City
	Tenn. Con. Coal Co.	Tracy City	16	Ramsey West	Tracy City
	Tenn. Con. Coal Co.	Tracy City		Reid Hill 1	Tracy City
13	<i>Marion County</i>			Street Hill	Tracy City
	Battle Creek Coal & C. Co.	Orme	17	<i>Marion County</i>	
	New Etna Coal Co.	Chattanooga		Battle Creek	Orme
14	New Etna Coal Co.	Chattanooga		New Etna 1	Whiteside
	New Etna Coal Co.	Chattanooga	18	New Etna 2	Whiteside
	New Etna Coal Co.	Chattanooga		New Etna 3	Whiteside
15	New Etna Coal Co.	Chattanooga		New Etna 4	Whiteside
	New Etna Coal Co.	Chattanooga	19	New Etna 5	Whiteside
	Nunley Ridge Coal Co.	Tracy City		Pryor Ridge	Tracy City
16	Tenn. Coal Iron & Ry. Co.	Birmingham, A	20	Thomas 1-2	Whitwell
	Tenn. Coal Iron & Ry. Co.	Birmingham, A		Thomas 5	Whitwell
	Tenn. River Coal Co.	So. Pittsburg		Tennessee River	Richard City
17	<i>Overton County</i>		21	<i>Overton County</i>	
	Brier Hill Collieries	Crawford		Brier Hill 1	Crawford
	Brier Hill Collieries	Crawford	22	Brier Hill 2	Crawford
18	Brier Hill Collieries	Crawford		Brier Hill 4	Crawford
	Laurel Creek Coal Co.	Wilder		Laurel Creek	Wilder
19	Obey City Coal Co.	Obey City	23	Obey City	Obey City
	Peacock Coal Co.	Obey City		Peacock 4-5	Obey City
	<i>Sequatchie County</i>			<i>Sequatchie County</i>	
20	Southern Iron & Steel Co.	Birmingham, A	24	Douglass 2	Dunlap

*Name and postoffice address of coal mine operators in Tennessee.
January 1, 1910—continued.*

No.	OPERATOR		No.	MINE		
	COUNTY AND NAME	POSTOFFICE		COUNTY AND NAME	POSTOFFICE	
22	White County		44	White County		
	Bon Air Coal & Iron Co	Nashville		Bon Air (Shaft)	Bon Air	
	Bon Air Coal & Iron Co	Nashville		Bon Air 6	Bon Air	
	Bon Air Coal & Iron Co	Nashville		Eastland 1	Eastland	
	Bon Air Coal & Iron Co	Nashville		Eastland 2	Eastland	
23	Bon Air Coal & Iron Co	Nashville	45	Ravenscroft	Ravenscroft	
	Clifty Creek Coal Co	Clifty	46	Clifty Creek 1	Clifty	
	Clifty Creek Coal Co	Clifty	47	Clifty Creek 2	Clifty	
24	Clifty Creek Coal Co	Clifty	48	Clifty Creek 3	Clifty	
	Hamilton County		52	Hamilton County		
	Lewis and Smith	Soddy r.f.d.2		Lewis	Soddy r.f.d.2	
	Montlake Coal Co	Chattanooga		53	Montlake	Montlake
	New Soddy Coal Co	Chattanooga		54	Big Soddy A	Soddy
	New Soddy Coal Co	Chattanooga		55	Big Soddy B	Soddy
	New Soddy Coal Co	Chattanooga		56	Big Soddy 1	Soddy
	New Soddy Coal Co	Chattanooga		57	Big Soddy 2	Soddy
	New Soddy Coal Co	Chattanooga		58	Big Soddy 3	Soddy
	New Soddy Coal Co	Chattanooga		59	Big Soddy 4	Soddy
26	New Soddy Coal Co	Chattanooga		60	New Soddy 1-2	Soddy
	New Soddy Coal Co	Chattanooga	61	New Soddy 4	Soddy	
	New Soddy Coal Co	Chattanooga	62	New Soddy 5	Soddy	
	New Soddy Coal Co	Chattanooga	63	New Soddy 9	Soddy	
	New Soddy Coal Co	Chattanooga	64	New Soddy 10	Soddy	
	Sale Creek Coal Co	Soddy	65	Sale Creek	Sale Creek	
	Morgan County		66	Morgan County		
	Big Brushy Coal & C Co	Petros		Big Brushy 1-2	Petros	
	Big Mt. Coal Co	Oliver Springs		67	Big Mt.	Oliver Springs
	Blue Ridge Coal Co	Oliver Springs		68	Blue Ridge	Oliver Springs
Bowling Coal Co	Coalfield	69		Bowling 1	Coalfield	
Bowling Coal Co	Coalfield	70		Bowling 2	Coalfield	
Butler Coal Mining Co	Oliver Springs	71		Butler 2	Oliver Springs	
Cow Creek Coal Co	Oliver Springs	72		Cow Creek	Oliver Springs	
Dixie Coal Co	Oliver Springs	73		Dixie	Oliver Springs	
Emory River Coal Co	Rockwood	74		Babahatchie	Oakdale	
35	J. A. Fagan	Coalfield r.f.d.	75	Fagan	Coalfield r.f.d.	
36	G. W. Fairchild	Sunbright	76	Fairchild	Sunbright r.f.d.	
37	Harriman Coal Co	Harriman	77	Harriman	Harriman	
38	Jackson Bros. Coal Co	Oliver Springs	78	Jackson	Oliver Springs	
39	Little Brushy Coal Co	Coalfield	79	Little Brushy	Coalfield	
40	Mt. Carbon Coal Co	Oliver Springs	80	Mount Carbon	Oliver Springs	
41	Oliver Coal Co	Oliver Springs	81	Oliver	Oliver Springs	
42	Poplar Creek Coal Co	Oliver Springs	82	Poplar Creek	Oliver Springs	
43	Prudential Coal Co	Oliver Springs	83	Prudential	Oliver Springs	
44	State of Tennessee	Nashville	84	Brushy Mt. 1	Petros	
	State of Tennessee	Nashville	85	Brushy Mt. 3	Petros	
46	Rhea County		86	Rhea County		
	Dayton Coal & Iron Co	Dayton		New Prospect	Dayton	
	Dayton Coal & Iron Co	Dayton		87	Richland 13-14	Dayton
	Fox Coal Co	Chattanooga		88	Fox 1	Graysville
	Fox Coal Co	Chattanooga		89	Fox 2	Graysville
47	Fox Coal Co	Chattanooga	90	Fox 3	Graysville	
	Fox Coal Co	Chattanooga	91	Fox 4	Graysville	
48	Simpson & Dodson	Spring City	92	Spring City	Spring City	
49	Roane County		93	Roane County		
	Roane Iron Co	Rockwood		McLean	Rockwood	
	Roane Iron Co	Rockwood		94	Old	Rockwood

*Name and postoffice address of coal mine operators in Tennessee.
January 1, 1910—continued.*

No.	OPERATOR		No.	MINE	
	COUNTY AND NAME	POSTOFFICE		COUNTY AND NAME	POSTOFFICE
Scott County					
50	Baker Coal & Coke Co.	Newland	95	Baker	Newland
51	Glen Mary Coal & Coke Co.	Glen Mary	96	Glen Mary 2-4	Glen Mary
	Glen Mary Coal & Coke Co.	Glen Mary		Glen Mary 5	Glen Mary
52	Jasper Hughett	Robbins	98	Robbins, B. G.	Robbins
53	J. V. LeMoyné	Baltimore, Md	99	LeMoyné	Isham
54	Oneida Coal Co.	Oneida	100	Oneida	Oneida
55	Paint Rock Coal M. Co	Harriman	101	Paint Rock 1	Oneida r.f.d.
	Paint Rock Coal M. Co	Harriman		Paint Rock 2	Oneida r.f.d.
	Paint Rock Coal M. Co	Harriman		Paint Rock 3	Oneida r.f.d.
56	Pine Knot Coal Co	Harriman	104	PineKnot	Laxton
57	Scott Co Coal Co	Helenwood	105	Lehigh 5	Helenwood
	Scott Co Coal Co	Helenwood		Lehigh 6	Helenwood
58	Southern Clay Mfg. Co.	Chattanooga	107	Southern Clay	Robbins
59	Stanley Coal Co	Harriman	108	Stanley	Oneida r.f.d.
Anderson County					
60	Black Diamond Coal Co	Knoxville	109	Black Diamond 1	Coal Creek
	Black Diamond Coal Co	Knoxville		Black Diamond 5	Coal Creek
	Black Diamond Coal Co	Knoxville		Black Diamond 6	Briceville
61	Campbell Coal Mining Co	Oliver Springs	112	Campbell 2	Oliver Springs
	Campbell Coal Mining Co	Oliver Springs		Campbell 3	Oliver Springs
	Campbell Coal Mining Co	Oliver Springs		Campbell 4	Oliver Springs
62	Coal Creek Coal Co	Knoxville	115	Fraterville 1	Coal Creek
	Coal Creek Coal Co	Knoxville		Taft	Coal Creek
	Coal Creek Coal Co	Knoxville		Thistle	Coal Creek
63	Knoxville Iron Co	Knoxville	118	Cross Mt. 1	Briceville
	Knoxville Iron Co	Knoxville		Cross Mt. 3	Briceville
	Oliver Springs C. & Clay Co.	Oliver Springs		Reed	Oliver Springs
64	D. J. Riding	Briceville	121	Riding	Briceville
66	Royal Coal & Coke Co	Knoxville	122	Brookside	Pless
	Royal Coal & Coke Co	Knoxville		Buck Mt.	Pless
	Royal Coal & Coke Co	Knoxville		Eureka 2	Pless
67	Tennessee Coal Co	Knoxville	125	Middle Ridge	Briceville
	Tennessee Coal Co	Knoxville		Tennessee	Briceville
68	Windrock Coal & Coke Co	Windrock	127	Windrock	Windrock
Campbell County					
69	Anchor Coal Co	Knoxville	128	Anchor	Morley
70	Arnett and Hale	Newcomb	129	Arnetts Lone Mt.	Newcomb
71	Lewis Baird	Elk Valley	130	Baird, B. G	Elk Valley
72	Bear Wallow Coal Co	Careyville	131	Bear Wallow	Careyville
73	Big Block Coal Co	Cupp	132	Big Block	Cupp
74	Black Gem Coal Co	Knoxville	133	Black Gem	Careyville
75	Block Coal & Coke Co	Block	134	Block 2	Block
	Block Coal & Coke Co	Block		Block 3	Block
76	Blue Gem Coal Co	Jellico	136	Blue Gem (Speed)	Jellico
77	Campbell Coal Mining Co	Westbourne	137	Jackson	Westbourne
78	Careyville Coal Co	Careyville	138	Careyville	Careyville
79	Chaska Coal Co	Knoxville	139	Chaska	Chaska
80	Davis Creek Coal Co	Cupp	140	Davis Creek 1	Cupp
	Davis Creek Coal Co	Cupp		Davis Creek 2	Cupp
81	Elk Hart B. G. Coal Co	Elk Valley	142	Elk Hart B. G	Elk Valley
82	Elk Valley Coal Mining Co	Elk Valley	143	Elk Valley	Elk Valley
83	Evans Coal Co	Jellico	144	Evans	Jellico
84	Falls Branch Coal Co	Wooldridge	145	Falls Branch	Wooldridge
	Falls Branch Coal Co	Wooldridge		Powhattan	Wooldridge

Name and postoffice address of coal mine operators in Tennessee.
January 1, 1910—continued.

No.	OPERATOR		No.	MINE	
	COUNTY AND NAME	POSTOFFICE		COUNTY AND NAME	POSTOFFICE
	<i>Campbell Co.—Con.</i>			<i>Campbell Co.—Con.</i>	
85	Italian B. G. Coal Co.	Newcomb.	147	Italian B. G.	Newcomb
86	Italy Coal Co.	Jellico.	148	Italy.	Cupp
87	Jellico B. G. Coal Co.	Jellico.	149	Jellico B. G.	Jellico
88	Kimberly Mining Co.	Knoxville.	150	Kimberly.	Cupp
89	LaFollette Coal I. & Ry. Co	LaFollette.	151	Gem.	Peabody
	LaFollette C. I. & Ry. Co	LaFollette.	152	Rex 1.	LaFollette
	LaFollette C. I. & Ry. Co	LaFollette.	153	Rex 2.	LaFollette
90	M. H. Layne.	Newcomb.	154	Layne.	Newcomb
91	Morley Coal Co.	Morley.	155	Morley.	Morley
92	Proctor Coal Co.	Red Ash, Ky.	156	Indian Mt. 1.	Red Ash, Ky.
	Proctor Coal Co.	Red Ash, Ky.	157	Indian Mt. 2.	Red Ash, Ky.
93	Red Ash Coal Co.	Careyville.	158	Red Ash.	Careyville
94	Remy Coal Co.	Gatliff.	159	Romy.	Gatliff
95	Rich Mt. Coal & C. Co.	Bennett.	160	Rich Mt. 1.	Bennett
	Rich Mt. Coal & C. Co.	Bennett.	161	Rich Mt. 2.	Bennett
96	Royal Coal & Coke Co.	Knoxville.	162	Cambria.	Coal Creek
	Royal Coal & Coke Co.	Knoxville.	163	Royal (Old).	Coal Creek
97	Southern Coal & Coke Co	Gatliff.	164	Southern 1.	Gatliff
	Southern Coal & Coke Co	Gatliff.	165	Southern 2.	Gatliff
98	Sun Coal Co.	Careyville.	166	Sun.	Careyville
99	Sunshine Coal Co.	Jellico.	167	Sunshine.	Jellico
100	Tenn.-Jellico Coal Co.	Anthras.	168	Tenn.-Jellico.	Anthras
101	Tenn. Powder Co.	Jellico.	169	Tenn. B. G.	Jellico
102	Westbourne Coal Co.	Westbourne.	170	Westbourne 1-2.	Westbourne
	Westbourne Coal Co.	Westbourne.	171	Westbourne 3.	Westbourne
103	Whistle Creek Coal Co.	Newcomb.	172	Whistle Creek.	Newcomb
104	C. M. Woodward.	Jellico.	173	Woodward 2.	Jellico
105	Wooldridge-Jellico Coal Co	Wooldridge.	174	Mary-Anna.	Wooldridge
	Wooldridge-Jellico Coal Co	Wooldridge.	175	Wooldridge.	Wooldridge
106	Zechini Coal Co.	Newcomb.	176	Zechini.	Newcomb
	<i>Claiborne County</i>			<i>Claiborne County</i>	
107	Bryson Mt. Coal & C. Co	Middlesboro, K	177	Bryson Mt 1.	Hartranft
	Bryson Mt. Coal & C. Co	Middlesboro, K	178	Bryson Mt. 2.	Hartranft
108	Campbell Coal & Coke Co	Eagan.	179	Buffalo.	Eagan
109	Fork Ridge Coal & C. Co.	Fork Ridge.	180	Fork Ridge 1 (F).	Fork Ridge
	Fork Ridge Coal & C. Co.	Fork Ridge.	181	Fork Ridge 2 (S).	Fork Ridge
	Fork Ridge Coal & C. Co.	Fork Ridge.	182	Fork Ridge 3.	Fork Ridge
110	King Mt. Coal Co.	Clairfield.	183	King Mt.	Clairfield
111	Mingo Coal & Coke Co.	Hartranft.	184	Mingo 1.	Hartranft
	Mingo Coal & Coke Co.	Hartranft.	185	Mingo 2.	Hartranft
	Mingo Coal & Coke Co.	Hartranft.	186	Mingo 3.	Hartranft
	Mingo Coal & Coke Co.	Hartranft.	187	Mingo 5.	Hartranft
112	New Jellico Coal Co.	Clairfield.	188	New Jellico.	Clairfield
113	Nicholson Coal Co.	Nicholson.	189	Nicholson 2.	Nicholson
	Nicholson Coal Co.	Nicholson.	190	Nicholson 3.	Nicholson
114	Pruden Coal & Coke Co	Knoxville.	191	Pruden 1.	Pruden
	Pruden Coal & Coke Co	Knoxville.	192	Pruden 2.	Pruden
115	Reliance Coal & Coke Co	Hartranft.	193	Reliance 1-2.	Hartranft
	Reliance Coal & Coke Co	Hartranft.	194	Reliance 3.	Hartranft
116	Standard Coal & Coke Co	Clairfield.	195	Standard.	Clairfield
117	Sterling Coal & Coke Co	Manring.	196	Sterling 1-2.	Manring
118	Yellow Creek Coal Co.	Middlesboro, K	197	Yellow Creek 2.	Bosworth, Ky.
	Yellow Creek Coal Co.	Middlesboro, K	198	Yellow Creek 3.	Bosworth, Ky.

The following statement shows the average number of employes in and around the coal mines of Tennessee, and in what capacity employed, by counties and districts, in 1909; also average number of days active and total amount paid for labor.

Employes in and around Tennessee coal mines in 1909, average number of days active and total amount paid for labor.

COUNTIES AND DISTRICTS	UNDERGROUND WORKERS							OUTSIDE WORKERS				Grand Total Work-ers Inside and Outside	Average Number of Days Active	Total Amount Paid for Labor
	Pick Miners	Haulage Men	Foremen	Machine Miners	Machine Run-ners & Helpers	Others Insine	Total Inside	Blacksmiths	Timber Men	Others Outside	Total Outside			
	1	2	3	4	5	6	7	8	9	10	11			
<i>First District</i>														
Bledsoe	40	6	1	---	---	1	48	1	1	5	7	55	150	-----
Cumberland	50	6	1	---	---	6	63	1	1	15	17	80	216	-----
Fentress	75	9	1	---	---	6	91	1	2	9	12	103	231	-----
Grundy	536	44	8	---	---	27	615	8	13	35	56	671	182	-----
Marion	611	73	11	7	8	77	787	8	11	92	111	898	236	-----
Overton	75	12	3	---	---	13	103	3	---	11	14	117	187	-----
Sequatchie	159	15	2	---	---	---	176	2	2	10	14	190	50	-----
White	242	52	5	86	32	79	496	11	10	88	109	605	196	-----
Total	1,788	217	32	93	40	209	2,379	35	40	265	340	2,719	197	\$1,098,486
<i>Second District</i>														
Hamilton	250	16	3	---	---	102	371	4	6	65	75	446	191	-----
Morgan	469	81	11	58	14	86	719	9	20	57	86	805	181	-----
Rhea	179	50	6	---	---	25	260	4	1	33	38	298	194	-----
Roane	123	60	4	---	---	45	232	1	5	21	27	259	280	-----
Scott	271	27	9	---	---	26	333	7	12	38	57	390	167	-----
Total	1,292	234	33	58	14	284	1,915	25	44	214	283	2,198	199	\$ 759,565
<i>Third District</i>														
Anderson	689	140	15	149	25	89	1,107	15	33	140	188	1,295	210	-----
Campbell	1,714	348	46	405	97	171	2,781	38	69	267	374	3,155	203	-----
Clalborne	859	216	19	104	40	157	1,395	17	30	137	184	1,579	238	-----
Total	3,262	704	80	658	162	417	5,283	70	132	544	746	6,029	214	\$2,765,474
Grand total	6,342	1,155	145	809	216	910	9,577	130	216	1,023	1,369	10,946	207	\$4,623,525

a —Of this number 434 were at the State Mines at Petros.

The following statement shows average wages paid per day to employes in and around the coal mines of Tennessee in 1909, arranged by counties and districts.

Average wages paid to employes of Tennessee coal mines per day in 1909.

COUNTIES AND DISTRICTS	UNDERGROUND WORKERS							OUTSIDE WORKERS				Grand Total Work- ers Inside and Outside
	Pick Miners	Haulage Men	Foremen	Machine Miners	Machine Runners and Helpers	Others Inside	Total Inside	Blacksmiths	Timber Men	Others Outside	Total Outside	
	13	14	15	16	17	18	19	20	21	22	23	
<i>First District</i>												
Bledsoe												
Cumberland												
Fertress												
Grundy												
Marion												
Overton												
Sequatchie												
White												
Total	\$2.07	\$1.75	\$3.81	\$2.29	\$2.65	\$1.68	\$2.05	\$2.36	\$1.84	\$2.08	\$2.08	\$2.05
<i>Second District</i>												
Hamilton												
Morgan												
Rhea												
Roane												
Scott												
Total	\$2.39	\$1.81	\$3.25	\$1.97	\$2.54	\$1.87	\$2.25	\$1.96	\$1.96	\$1.52	\$1.62	\$2.17
<i>Third District</i>												
Anderson												
Campbell												
Claborn												
Total	\$2.20	\$1.95	\$4.00	\$2.01	\$2.07	\$2.11	\$2.16	\$2.37	\$1.96	\$1.98	\$2.01	\$2.14
Grand Total	\$2.19	\$1.90	\$3.80	\$2.08	\$2.23	\$1.94	\$2.15	\$2.30	\$1.95	\$1.92	\$1.96	\$2.12

The following statement shows coal product and values in Tennessee in 1909 by counties, also disposition of product and average value per ton obtained.

Coal product and values, disposition of product, and average value per ton obtained in 1909.

COUNTY	COAL PRODUCT (Short Tons)					COAL VALUES	
	Loaded for Shipment	Used for Fuel and Steam	Sold Local Trade and Employees	Coked	Total Product	Total Value	Average Value Per Ton
	37	38	39	40	41	42	43
Anderson.....	765,460	14,935	6,472	-----	786,867	\$827,601	\$1.05
Bledsoe.....	19,000	120	180	-----	19,300	21,230	1.10
Campbell.....	1,534,345	23,843	19,190	12,811	1,590,189	1,815,487	1.14
Claiborne.....	1,352,784	23,104	1,448	-----	1,377,336	1,367,792	1.00
Cumberland.....	63,932	554	353	-----	64,839	62,141	0.96
Fentress.....	74,102	2,083	245	-----	76,430	79,819	1.04
Grundy.....	315,774	976	591	18,107	335,448	368,667	1.10
Hamilton.....	158,148	7,649	2,856	55,550	224,203	256,750	1.15
Marion.....	426,831	7,671	4,291	30,361	469,154	594,729	1.27
Morgan.....	338,668	12,950	2,891	100,693	a455,202	a431,589	0.95
Overton.....	50,090	821	79	-----	50,990	50,993	1.00
Rhea.....	255	13,526	273	103,872	117,926	156,524	1.33
Roane.....	-----	11,429	3,829	167,748	183,006	214,915	1.17
Scott.....	120,699	981	2,529	-----	124,209	145,981	1.18
Sequatchie.....	5,111	416	221	15,762	21,510	26,887	1.25
White.....	295,375	13,490	2,009	-----	310,874	336,719	1.08
Total.....	5,520,574	134,548	47,457	504,904	6,207,483	6,757,824	1.09

a The product of the state operations at Brushy Mountain Mines at Petros amounts to 308,937 short tons valued at \$286,939, or 93 cents per ton. The product of Morgan County excluding the operations of the State mines, amount to 146,265 short tons, valued at \$144,650, or 0.99 cents per ton.

The following statement shows coal product of Tennessee from 1840 to 1909 inclusive and coal values of Tennessee from 1873 to 1909, inclusive.

Coal product and values of Tennessee 1840 to 1909, inclusive.

YEAR	Product (short tons)	Value (dollars)	Value per ton	YEAR	Product (short tons)	Value (dollars)	Value per ton
1840 ^a	558			1875	380,000	396,000	\$1.10
1841	600			1876	550,000	605,000	1.10
1842	1,000			1877	450,000	495,000	1.10
1843	4,500			1878	375,000	412,000	1.10
1844	10,000			1879	496,131	545,744	1.10
1845	18,000			1880	641,042	769,250	1.20
1846	25,000			1881	750,000	900,000	1.20
1847	30,000			1882	850,000	1,020,000	1.20
1848	40,000			1883	1,000,000	1,150,000	1.15
1849	52,000			1884	1,200,000	1,380,000	1.15
1850	60,000			1885	1,440,957	1,585,052	1.10
1851	70,000			1886	1,714,290	1,885,719	1.10
1852	75,000			1887	1,900,000	2,090,000	1.10
1853	85,000			1888	1,967,297	2,164,026	1.10
1854	90,000			1889	1,925,689	2,338,309	1.21
1855	100,000			1890	2,169,585	2,386,543	1.10
1856	115,000			1891	2,404,484	2,655,045	1.10
1857	125,000			1892	2,332,677	2,635,924	1.13
1858	135,000			1893	1,902,258	2,048,449	1.08
1859	150,000			1894	2,180,879	2,119,481	0.97
1860 ^a	165,300			1895	2,319,720	2,157,340	0.93
1861	150,000			1896	2,663,714	2,251,064	0.86
1862	140,000			1897	2,880,994	2,316,239	0.81
1863	100,000			1898	3,084,748	2,340,346	0.77
1864	100,000			1899	3,736,134	3,287,797	0.88
1865	100,000			1900	3,904,048	4,294,928	1.10
1866	100,000			1901	3,785,672	4,115,974	1.09
1867	110,000			1902	4,232,332	5,278,921	1.25
1868	125,000			1903	4,810,758	6,173,724	1.28
1869	130,000			1904	4,847,242	5,617,095	1.16
1870 ^a	133,418			1905	5,552,576	6,496,865	1.17
1871	180,000			1906	6,272,457	7,565,286	1.20
1872	224,000			1907	6,940,911	8,482,899	1.22
1873	350,000	385,000	\$1.10	1908	6,082,851	6,961,393	1.14
1874	350,000	385,000	\$1.10	1909	6,207,483	6,757,824	1.09

^aU. S. census (fiscal year). All other data from 1841 to 1872, inclusive, obtained from U. S. Geological Survey (fiscal report).

The following statement shows coal product and values and values per ton in Tennessee, by counties and districts, in 1909, compared with 1908, also increases and decreases.

Coal product and values in Tennessee in 1909, compared with 1908.

COUNTIES AND DISTRICTS	1909			1908			Increase (+), or Decrease (-), 1909	
	Product (Short Tons)	Value (Dollars)	Value Per Ton	Product (Short Tons)	Value (Dollars)	Value Per Ton	Product (Short Tons)	Value (Dollars)
<i>First District.</i>								
Bledsoe	19,300	21,230	\$1.10	30,000	32,500	\$1.08	- 10,700	- 11,270
Cumberland	64,839	62,141	0.96	28,204	34,365	1.22	+ 36,635	+ 27,776
Fentress	76,430	79,819	1.04	98,773	108,554	1.09	- 22,343	- 28,735
Grundy	335,448	368,667	1.10	512,117	561,993	1.10	- 176,669	- 193,326
Marion	469,154	594,729	1.27	405,121	529,960	1.30	+ 64,033	+ 64,769
Overton	50,990	50,993	1.00	45,122	50,028	1.11	+ 5,868	+ 965
Putnam	-----	-----	-----	1,100	2,000	1.80	- 1,100	- 2,000
Sequatchie	21,510	26,887	1.25	-----	-----	-----	+ 21,510	+ 26,887
White	310,874	336,719	1.08	311,522	362,926	1.16	- 648	- 26,207
Total	1,348,545	1,541,185	\$1.14	1,431,959	1,682,326	\$1.17	- 83,414	- 141,141
<i>Second District</i>								
Hamilton	224,203	256,750	\$1.15	58,743	75,301	\$1.30	+ 165,460	+ 181,449
Morgan	455,202	431,589	0.95	570,163	636,332	1.12	- 114,961	- 204,743
Rhea	117,926	156,524	1.33	160,447	198,865	1.23	- 42,521	- 42,341
Roane	183,006	214,915	1.17	162,779	185,536	1.14	+ 20,227	+ 29,379
Scott	124,209	145,981	1.18	95,191	134,143	1.41	+ 29,018	+ 11,838
Total	1,104,546	1,205,759	\$1.10	1,047,323	1,230,177	\$1.17	+ 57,223	- 24,418
<i>Third District</i>								
Anderson	786,867	827,601	\$1.05	860,480	949,006	\$1.10	- 73,613	- 121,405
Campbell	1,590,189	1,815,487	1.14	1,537,895	1,889,648	1.23	+ 52,294	- 74,161
Claiborne	1,377,336	1,367,792	1.00	1,205,194	1,210,236	1.00	+ 172,142	+ 157,556
Total	3,754,392	4,010,880	\$1.07	3,603,569	4,048,890	\$1.12	+ 150,823	- 38,010
Grand total ..	6,207,483	6,757,824	\$1.09	6,082,851	6,961,393	\$1.14	+ 124,632	- 203,569

RECAPITULATION.

DISTRICT	INCREASE IN 1909		DECREASE IN 1909	
	Product (Short Tons)	Value	Product (Short Tons)	Value
First	128,046	\$120,397	211,460	\$261,538
Second	214,705	222,666	157,482	247,084
Third	224,436	157,556	73,613	195,566
Total	567,187	\$500,619	442,555	\$ 704,188
			Product	Value
Total Increases			567,187	\$ 500,619
Total Decreases			442,555	704,188
Net Increase or Decrease			+ 124,632	-\$203,569

The following statement shows rank of coal producing counties in Tennessee in 1909, first in quantity of product and then in value of product, with percentage of each contributed by each county.

Relative rank of coal producing counties in Tennessee in 1909, with amount and value of product, and percentage of each.

Rank	COUNTY	Amount of Product (Short Tons)	Per Cent of Total Product	Rank	COUNTY	Value of Product	Per Cent of Total Product
1	Campbell	1,590,189	25.62	1	Campbell	\$1,815,437	26.86
2	Claiborne	1,377,336	22.19	2	Claiborne	1,367,792	20.24
3	Anderson	786,867	12.67	3	Anderson	827,601	12.25
4	Marion	469,154	7.55	4	Marion	594,720	8.80
5	Morgan	455,202	7.33	5	Morgan	431,589	6.39
6	Grundy	335,448	5.44	6	Grundy	368,667	5.46
7	White	310,874	5.00	7	White	336,719	4.98
8	Hamilton	224,203	3.61	8	Hamilton	256,750	3.80
9	Roane	183,006	2.95	9	Roane	214,915	3.18
10	Scott	124,209	2.00	10	Rhea	156,524	2.31
11	Rhea	117,926	1.90	11	Scott	145,981	2.16
12	Fentress	76,430	1.23	12	Fentress	79,819	1.18
13	Cumberland	64,839	1.04	13	Cumberland	62,141	.92
14	Overton	50,990	.82	14	Overton	50,993	.76
15	Sequatchie	21,510	.34	15	Sequatchie	26,887	.40
16	Bledsoe	19,300	.31	16	Bledsoe	21,230	.31
	Total	6,207,483	100.00		Total	\$6,757,824	100.00

It will be observed from this statement that Campbell County is the first in rank of coal producing counties, furnishing 25.62 per cent of the total product, and also first in rank as to coal values, furnishing 26.86 per cent of the total coal values for the state. Claiborne County furnished 22.19 per cent of the total coal product for the state, while it only furnished 20.24 per cent of the total coal values for the state. Scott County is tenth in rank as to coal product, but eleventh in rank as to coal values. Rhea County is eleventh in rank as to coal product, while it is tenth in rank as to coal values. Sequatchie County again reappears in the list of coal producing counties, after remaining idle during 1908 and the greater part of 1909.

The following statement shows relative rank of coal producing counties in Tennessee from 1891 to 1909, inclusive:

Relative rank of coal producing counties from 1891 to 1909, inclusive.

COUNTY	YEAR																		
	1891	1892	1893	1894	1895	1896	1897	1898	1899	1900	1901	1902	1903	1904	1905	1906	1907	1908	1909
Anderson.....	1	1	1	1	2	1	1	1	1	1	1	1	3	3	3	3	3	3	3
Bledsoe.....												14	15	15	15	16	16	14	16
Campbell.....	6	3	3	4	4	2	2	2	3	2	2	3	2	2	1	1	1	1	1
Claiborne.....	11	6	5	5	5	6	6	5	4	4	3	2	1	1	2	2	2	2	2
Cumberland.....	14	14	14	14	14	13	13	13	13	12	12	11	10	10	14	14	14	15	13
Fentress.....														14	12	12	13	10	12
Franklin.....	12	12	12	12	13	14	14	14	15	15									
Grundy.....	2	2	2	2	1	3	3	6	5	5	6	5	6	6	6	6	5	5	6
Hamilton.....	4	8	7	6	6	9	7	9	7	8	7	6	7	7	8	8	12	8	
Marion.....	3	4	4	3	3	4	4	4	6	6	5	7	5	5	5	7	7	6	4
Morgan.....	8	11	10	11	11	5	5	3	2	3	4	4	4	4	4	4	4	4	5
Overton.....											15	15	13	13	13	13	15	13	14
Putnam.....	13	13	13	13	12	12	12	12	12	13	13						17	16	
Rhea.....	5	7	9	8	10	11	10	7	8	7	9	8	8	8	9	9	9	9	11
Roane.....	9	9	11	9	9	8	8	10	9	10	10	10	11	11	10	11	11	8	9
Scott.....	7	5	6	7	7	7	11	11	11	11	11	12	12	12	11	10	10	11	10
Sequatchie.....									14	14	14	13	14	16	16	15	12		15
White.....	10	10	8	10	8	10	9	8	10	9	8	9	9	9	7	5	6	7	7

It will be observed from this table that Anderson County, with the exception of the year 1895, maintained the lead from 1891 to 1902, inclusive, when it was assumed by the county of Claiborne, and maintained for two years, when it was assumed and is now held by the county of Campbell, with Claiborne ranking second and Anderson third.

As compared with 1908, Hamilton County has been reinstated from twelfth to eighth position in rank, where it was in 1907. Marion County has climbed from sixth to fourth position in rank, while Morgan County has fallen from fourth to fifth position in rank.

The following table gives rank of coal producing states in the United States in 1908, first in quantity of product and second in value of product, with percentage of each:

Rank of coal producing States in 1908, with quantity and value of product and percentage of each.

PRODUCTION				VALUE			
Rank	State or Territory	Quantity (short tons)	Percentage of total production	Rank	State or Territory	Value	Percentage of total value
1	Pennsylvania:			1	Pennsylvania:		
	{ Anthracite	83, 268, 754	20.0		{ Anthracite	\$158, 178, 849	29.7
	{ Bituminous	117, 179, 527	28.2		{ Bituminous	118, 816, 303	22.3
2	Illinois	47, 659, 690	11.5	2	Illinois	49, 978, 247	9.4
3	West Virginia	41, 897, 843	10.1	3	West Virginia	40, 009, 054	7.5
4	Ohio	26, 270, 639	6.3	4	Ohio	27, 897, 704	5.2
5	Indiana	12, 314, 890	3.0	5	Alabama	14, 647, 891	2.8
6	Alabama	11, 604, 593	2.8	6	Colorado	13, 586, 988	2.6
7	Kentucky	10, 246, 553	2.5	7	Indiana	13, 084, 297	2.5
8	Colorado	9, 634, 973	2.3	8	Iowa	11, 706, 402	2.2
9	Iowa	7, 161, 310	1.7	9	Kentucky	10, 317, 162	1.9
10	Kansas	6, 245, 508	1.5	10	Kansas	9, 292, 222	1.7
11	Tennessee	6, 199, 171	1.5	11	Wyoming	8, 868, 157	1.7
12	Wyoming	5, 489, 902	1.3	12	Tennessee	7, 118, 499	1.3
13	Maryland	4, 377, 093	1.0	13	Washington	6, 690, 412	1.3
14	Virginia	4, 259, 042	1.0	14	Oklahoma	5, 976, 504	1.1
15	Missouri	3, 317, 315	.8	15	Missouri	5, 444, 907	1.0
16	Washington	3, 024, 943	.7	16	Maryland	5, 116, 753	1.0
17	Oklahoma	2, 948, 116	.7	17	Virginia	3, 868, 524	.7
18	New Mexico	2, 467, 937	.6	18	Montana	3, 771, 248	.7
19	Arkansas	2, 078, 357	.5	19	Arkansas	3, 499, 470	.7
20	Montana	1, 920, 190	.5	20	Texas	3, 419, 481	.6
21	Texas	1, 895, 377	.5	21	New Mexico	3, 368, 753	.6
22	Utah	1, 846, 792	.4	22	Michigan	3, 322, 904	.6
23	Michigan	1, 835, 019	.4	23	Utah	3, 119, 338	.6
24	North Dakota	320, 742	.1	24	North Dakota	522, 116	.1
25	Georgia	264, 822		25	Georgia	364, 279	.1
26	Oregon	86, 259		26	Oregon	236, 021	
27	California and Alaska	21, 862	.1	27	California and Alaska	69, 650	.1
28	Idaho	5, 429		28	Idaho	21, 832	
29	Massachusetts	50		29	Massachusetts	150	
	Total	415, 842, 698	100.0		Total	\$532, 314, 117	100.0

Compared with 1907, as to product, Alabama yielded fifth position to Indiana, while Kentucky captured seventh position from Colorado.

The following table shows quantity and value of coal produced in the United States in 1908 compared with 1907, with increases and decreases by states, and percentage of each:

Coal produced in the United States in 1908, compared with 1907 (short tons).

STATE OR TERRITORY	1907		1908		Increase (+), or Decrease (-), 1908		Percentage of Increase or Decrease, 1908	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Alabama	14,250,454	\$18,405,468	11,604,593	\$14,647,891	-2,645,861	-3,757,577	-18.57	-20.42
Arkansas	2,670,438	4,473,693	2,078,357	3,499,470	-592,081	-974,223	-22.17	-21.78
California and Alaska	24,089	91,813	21,862	69,650	-2,227	-22,163	-9.24	-24.14
Colorado	10,790,236	15,079,449	9,634,973	13,586,988	-1,155,263	-1,492,461	-10.71	-9.90
Georgia	362,401	499,686	264,822	364,279	-97,579	-135,407	-26.93	-27.10
Idaho	c 7,588	c 31,119	5,429	21,832	-2,159	-9,287	-28.45	-29.84
Illinois	51,317,146	54,687,382	47,659,690	49,978,247	-3,657,456	-4,709,135	-7.13	-8.61
Indiana	13,985,713	15,114,300	12,314,890	13,684,297	-1,670,823	-2,080,003	-11.95	-13.43
Iowa	7,574,322	12,258,012	7,161,310	11,906,402	-413,012	-551,610	-5.45	-4.50
Kansas	7,322,449	11,159,698	6,245,508	9,292,222	-1,076,941	-1,867,476	-14.71	-16.73
Kentucky	10,753,124	11,405,038	10,246,553	10,317,162	-506,571	-1,087,876	-4.71	-9.54
Maryland	5,532,628	6,623,697	4,377,093	5,116,753	-1,155,535	-1,506,944	-20.89	-22.75
Massachusetts			50	150	+50	+150		
Michigan	2,035,858	3,660,833	1,835,019	3,322,904	-200,839	-337,929	-9.87	-9.23
Missouri	3,997,936	6,540,709	3,317,315	5,444,907	-680,621	-1,095,802	-17.02	-16.75
Montana	2,016,857	3,907,082	1,920,190	3,771,248	-96,667	-135,834	-4.79	-3.48
New Mexico	2,628,959	3,832,128	2,467,937	3,368,753	-161,022	-463,375	-6.12	-12.09
North Dakota	347,760	560,199	320,742	522,116	-27,018	-38,063	-7.77	-6.80
Ohio	32,142,419	35,324,746	26,270,639	27,897,704	-5,871,780	-7,427,042	-18.27	-21.03
Oklahoma	3,642,658	7,433,914	2,948,116	5,976,504	-694,542	-1,457,410	-19.07	-19.60
Oregon	70,981	166,304	86,259	236,021	+15,278	+69,717	+21.52	+41.92
Pennsylvania bituminous	150,143,177	155,664,026	117,179,527	118,816,303	-32,963,650	-36,847,723	-21.95	-23.67
Tennessee	6,810,243	8,490,334	6,199,171	7,118,499	-611,072	-1,371,835	-8.97	-16.16
Texas	1,648,069	2,778,811	1,895,377	3,419,481	+247,308	+640,670	+15.01	+23.06
Utah	1,947,607	2,959,769	1,846,792	3,119,338	-100,815	+159,569	-5.18	+5.39
Virginia	4,710,895	4,807,533	4,259,042	3,868,524	-451,853	-939,009	-9.59	-19.54
Washington	3,680,532	7,679,801	3,024,943	6,690,412	-655,589	-969,389	-17.81	-12.88
West Virginia	48,091,583	47,846,630	41,897,843	40,009,054	-6,193,740	-7,837,576	-12.88	-16.38
Wyoming	6,252,990	9,732,668	5,489,902	8,868,157	-763,088	-864,511	-12.20	-8.88
Total bituminous	394,759,112	451,214,842	332,573,944	374,135,268	-62,185,168	-77,679,574	-15.75	-17.08
Pennsylvania anthracite	85,604,312	163,584,056	83,268,754	158,178,849	-2,335,558	-5,405,207	-2.73	-3.30
Grand total	480,363,424	614,798,898	405,842,698	532,314,117	-64,520,726	-82,484,781	-13.43	-13.42

c Includes production of Nebraska and Nevada.

It will be observed from this table that coal product decreased in all coal producing states in the United States, except in Oregon and Texas.

WORLD'S PRODUCTION OF COAL

The following table gives the production of coal of the principal countries of the world for the years nearest the one under review for which figures could be obtained.

For convenience the quantity of product is expressed in the unit of measurement existing in each country, and reduced for comparison to short tons of 2,000 pounds.

The world's production of coal.

COUNTRY	Usual Unit in Producing Country	Equivalent in Short Tons
United States (1908) ----- long tons ..	371, 288, 123	415, 842, 698
Great Britain (1908) ----- do ..	261, 506, 379	292, 887, 144
Germany (1908) ----- metric tons ..	215, 283, 474	237, 306, 973
Austria-Hungary (1907) ----- do ..	48, 180, 849	53, 109, 750
France (1903) ----- do ..	37, 622, 556	41, 471, 343
Russia and Finland (1907) ----- do ..	26, 023, 344	28, 685, 532
Belgium (1903) ----- do ..	22, 679, 300	24, 999, 392
Japan (1907) ----- do ..	13, 935, 952	15, 361, 600
India (1905) ----- long tons ..	12, 769, 635	14, 301, 991
Canada (1903) ----- short tons ..	10, 904, 466	10, 904, 466
New South Wales (1903) ----- long tons ..	9, 147, 025	10, 244, 668
Spain (1907) ----- metric tons ..	3, 887, 236	4, 284, 900
Transvaal (1903) ----- long tons ..	3, 012, 692	3, 374, 215
New Zealand (1907) ----- do ..	1, 831, 009	2, 050, 730
Natal (1907) ----- do ..	1, 530, 043	1, 713, 648
Queensland and Victoria (1907) ----- do ..	964, 229	1, 079, 936
Mexico (1906) ----- metric tons ..	767, 864	846, 416
Holland (1906) ----- do ..	532, 780	587, 283
Italy (1907) ----- do ..	453, 137	499, 493
Sweden (1907) ----- do ..	305, 338	336, 574
Cape Colony (1907) ----- long tons ..	128, 607	144, 040
Tasmania (1908) ----- do ..	61, 068	68, 396
Other countries ----- do ..	7, 000, 000	7, 840, 000
Total -----		1167, 941, 188
Percentage of the United States -----		35.6

a Includes China, Turkey, Servia, Portugal, United States of Colombia, Chile, Borneo and Labuan, Peru, Greece, etc.

It will be observed from this table that the United States now stands far in the lead of the coal producing countries of the world, furnishing 35.6 per cent, or more than one third of the entire coal product of the world. In 1868 the United States only furnished 15 per cent of the total world's coal supply, and Great Britain was first in rank of coal-producing countries up to 1899, when the United States assumed the lead and has since maintained it.

The following statement shows draft animals, explosives used and number of mine cars employed in the coal mines of Tennessee in 1909 by counties and districts.

Draft animals, explosives and mine cars used in Tennessee coal mines in 1909.

COUNTY AND DISTRICT	DRAFT ANIMALS			EXPLOSIVES USED		Mine Cars in Use
	Inside	Out-side	Total	Powder (kegs)	Dyna-mite (Pounds)	
	45	46	47	48		50
<i>First District</i>						
Bledsoe.....	7	2	9	640	-----	
Cumberland.....	6	2	8	3,299	720	70
Fentress.....	2	-----	2	3,517	772	185
Grundy.....	87	12	99	8,751	-----	832
Marion.....	72	14	86	13,708	23,471	971
Overton.....	8	1	9	3,360	425	208
Sequatchie.....	14	8	22	600	-----	200
White.....	52	19	71	9,276	5,981	1,517
Total.....	248	58	306	43,151	31,369	4,063
<i>Second District</i>						
Hamilton.....	51	12	63	10,413	11,195	704
Morgan.....	85	14	99	3,665	38,308	1,209
Rhea.....	39	4	43	5,058	8,974	431
Roane.....	48	6	54	3,763	2,355	320
Scott.....	27	12	39	7,375	6,960	558
Total.....	250	48	298	30,274	67,792	3,222
<i>Third District</i>						
Anderson.....	116	38	154	11,972	8,365	2,038
Campbell.....	245	57	302	25,572	50,615	4,415
Claiborne.....	135	37	172	9,634	23,726	2,095
Total.....	496	132	628	47,178	82,706	8,548
Grand Total.....	994	238	1,232	120,603	181,867	15,833

The following statement shows the number and make of mining machines in use, quantity of coal mined with machines, and improvements made in the coal mines of Tennessee in 1909.

Mining machines, coal mined with machines and improvements made in Tennessee coal mines in 1909.

COUNTY AND DISTRICT	MINING MACHINES IN USE, MAKE AND NUMBER											Coal Mined with Machines (Short Tons)	IMPROVEMENTS MADE		
	Pick					Chain Breast							Inside	Outside	Total
	Harrison	Ing-Sargent	Sullivan	Other Kinds	Total Pick	Jeffrey-Elec.	Sullivan	Goodman	Morgan-Gardner	Total Chain Breast	Grand Total Machines				
51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	
First District															
Bledsoe													\$	\$	\$
Cumberland															
Fentress															
Grundy													200		200
Marion		7			7						7	50,000	1,110	11,905	13,015
Overton													1,279	1,459	2,738
Sequatchie															
White		20	4		24						24	108,529	1000	4000	5000
Total		27	4		31						31	158,529	\$ 3,589	\$ 17,364	\$ 20,953
Second District															
Hamilton													\$ 9,200	\$ 3,850	\$ 13,050
Morgan		12	1		13	1	3			4	17	57,284	10,422	5,875	16,297
Rhea															
Roane													6,298	1,600	7,898
Scott															
Total		12	1		13	1	3			4	17	57,284	\$25,920	\$11,325	\$37,245
Third District															
Anderson	2	7			9	6	4	2		12	21	215,327	\$10,500	\$4,700	\$15,200
Campbell	35	20	10	2	67	3	10	1	4	18	85	384,604	19,895	28,945	48,840
Claiborne	8	13	2		23	2	2	2		6	29	147,664	14,008	55,532	69,540
Total	45	40	12	2	99	11	16	5	4	36	135	747,595	\$44,403	\$89,177	\$133,580
Grand total	45	79	17	2	143	12	19	5	4	40	183	963,408	\$73,912	\$117,866	\$191,778

COAL SEAMS

The following table shows name, thickness, elevation and analyses of such coal seams worked in Tennessee as were embodied in the annual reports of the operating companies, by counties, giving name of company and average daily capacity.

Name, thickness, elevation and analysis of coal seams worked in Tennessee in 1909.

OPERATOR COUNTY AND NAME	Average Daily Capacity Short Tons	SEAM WORKED			ANALYSIS					
		NAME	Elevation Above Sea Level (feet)	Thickness Inches	Fixed Carbon (Per cent)	Volatile Matter (Per cent)	Ash (Per cent)	Moisture (Per cent)	Sulphur (Per cent)	
	85	80	81	82	68	69	70	71	72	
<i>Anderson County</i>										
Black Diamond Coal Co.....	1,600	Coal Creek	900	44	63.15	29.78	2.65	2.35	0.19	
Campbell Coal Mining Co. No. 1.....	350	Coal Creek	930	72	56.12	40.06	2.82	1.00	-----	
Campbell Coal Mining Co. No. 2.....		Coal Creek	1,100	72	57.11	39.33	2.50	0.90	0.10	
Coal Creek Coal Co.....	600	Coal Creek	1,000	48	57.52	38.82	2.67	0.99	0.89	
Knoxville Iron Co.....	1,000	Coal Creek	1,006	48	55.10	40.75	3.40	0.75	0.78	
Royal Coal & Coke Co.....	460	Coal Creek	1,000	42	60.17	35.54	2.40	1.29	0.60	
Tennessee Coal Co.....	600	Coal Creek	975	48	63.42	31.47	3.34	1.34	0.43	
Windrock Coal & Coke Co.....	800	Dean	2,400	60	57.30	37.01	3.15	1.02	0.68	
<i>Bledsoe County</i>										
Atpontley Coal Co.....	200	Sewanee	1,500	34	63.57	28.17	7.10	1.16	1.15	
<i>Campbell County</i>										
Big Block Coal Co.....	75	Jellico	-----	30	57.45	31.61	2.04	1.85	1.05	
Block Coal & Coke Co.....	300	Block	2,360	38	50.77	46.53	1.43	1.27	-----	
Blue Gem Coal Co.....	200	Blue Gem	1,400	26	51.27	44.79	1.24	2.70	0.90	
Careyville Coal Co.....	300	Block	2,445	45	56.64	40.28	3.08	0.78	0.82	
Chaska Coal Co.....	125	Big Jellico	1,600	27-48	54.40	37.14	6.45	2.07	2.67	
Davis Creek Coal Co.....	177	Jellico	-----	40	53.43	40.46	0.54	0.57	2.23	
Falls Branch Coal Co.....	312	Jellico	1,250	36	60.60	35.44	1.60	2.36	-----	
Italian B. G. Coal Co.....	10	Blue Gem	1,200	22	56.40	39.00	1.25	2.44	0.70	
Italy Coal Co.....	80	Jellico	1,275	30	57.45	37.61	2.04	1.85	1.05	
Jellico B. G. Coal Co.....	250	Blue Gem	1,200	24	55.71	40.54	1.09	2.65	-----	
LaFollette Coal, Iron & Ry. Co.: { Gem Mine..... { Kent Mine..... { Rex, No. 1 Mine.....	2,000	Jordan..... Kent..... Rex.....	1,998 1,500 1,000	50 42 44	56.25 51.95 56.28	41.36 40.60 40.26	1.72 6.55 3.46	0.67 0.90 2.50	0.65 ----- 1.21	
M. H. Layne.....	10	Blue Gem	1,200	24	56.40	39.00	1.25	2.44	0.70	
Morley Coal Co.....	100	Kramor	1,370	33	58.18	38.56	2.25	2.01	0.70	
Proctor Coal Co.....	300	Jellico	1,300	42	61.02	36.50	2.00	0.48	-----	
Red Ash Coal Co.....	350	Red Ash	2,250	42	58.52	37.72	1.74	2.02	-----	
Remy Coal Co.....	350	Rich Mt	-----	36	54.24	42.64	1.42	1.70	0.65	
Royal Coal & Coke Co.....	250	Coal Creek	1,008	40	60.17	35.54	2.40	1.29	0.60	
Southern Coal & Coke Co.....	400	Jordan	1,800	55	59.25	36.32	2.13	2.30	1.07	
Westbourne Coal Co.....	300	Log Mt	-----	42	56.25	41.36	1.72	0.67	0.78	
Woodridge-Jellico Coal Co.....	500	Jellico	1,200	38	60.60	35.44	1.60	2.36	-----	
<i>Claiborne County</i>										
Bryson Mt. Coal & Coke Co.....	1,000	Mingo	1,755	60	60.87	34.63	2.43	1.63	0.44	
Campbell Coal & Coke Co.....	250	Remy	1,425	36	55.66	40.82	1.72	1.80	0.66	
Fork Ridge Coal & Coke Co. 1.....	660	Mingo	1,700	52	59.83	37.19	1.40	0.88	0.70	
Fork Ridge Coal & Coke Co. 3.....	50	Lower Hignite	2,500	48	64.00	30.40	2.60	2.40	0.60	
King Mt. Coal Co.....	200	Jellico	1,100	40	57.04	39.90	1.96	1.10	-----	
Nicholson Coal Co. No. 2.....	300	Jack Rock	1,800	66	60.51	34.50	4.99	-----	0.75	
Nicholson Coal Co. No. 3.....	250	Klondyke	2,050	66	55.10	36.30	6.30	1.20	1.10	
Pruden Coal Co.....	700	Mingo	1,700	60	57.98	38.82	1.60	1.60	0.72	
Reliance Coal & Coke Co.....	500	Mingo	1,600	60	57.95	40.40	1.35	0.30	-----	
Sterling Coal & Coke Co.....	900	Sterling	2,300	66	66.00	27.00	6.00	1.00	1.00	
Yellow Creek Coal Co. No. 2.....	150	Poplar Lick	2,425	54	60.51	34.50	4.99	1.50	0.72	
Yellow Creek Coal Co. No. 3.....	150	Jack Rock	2,275	54	60.51	34.50	4.99	1.50	0.60	

Name, thickness, elevation and analysis of coal seams worked in Tennessee—continued.

OPERATOR COUNTY AND NAME	Av. Daily Capacity Short Tons	SEAM WORKED			ANALYSIS					
		NAME	Elevation Above Sea Level (feet)	Thickness Inches	Fixed Carbon (Per cent)	Volatile Matter (Per cent)	Ash (Per cent)	Moisture (Per cent)	Sulphur (Per cent)	
85		80	81	82	68	69	70	71	72	
<i>Cumberland County</i>										
Clear Creek Coal Co.-----	200	Isoline-----	1,900	44	53.86	42.20	2.21	1.73	1.47	
Fall Creek Collieries-----	300	Up. Sewanee--	1,800	50	63.70	30.76	4.82	0.72	0.40	
Renfro Coal & Coke Co.-----	50	Sewanee-----	1,800	42	68.27	28.32	2.32	1.03	0.06	
Waldensia Coal & Coke Co-----	100	Up. Sewanee--	1,800	42-60	64.50	29.55	5.50	0.45	0.54	
<i>Fentress County</i>										
Fentress Coal & Coke Co.-----	600	Bon Air 2-----	1,600	48	50.77	35.80	10.06	3.37	2.09	
<i>Grundy County</i>										
Flat Branch Coal Co.-----	150	Sewanee-----	1,916	34	66.80	24.57	7.43	1.20	0.66	
Nunley Ridge Coal Co.-----	40	Sewanee-----	1,900	36	61.68	29.73	7.65	1.04	-----	
Sewanee Fuel & Iron Co.-----	500	Sewanee-----	1,920	30	59.88	31.32	7.50	1.30	0.85	
Tennessee Consolidated Coal Co.-----	1,500	Sewanee-----	1,900	42	61.68	29.73	7.65	1.04	-----	
<i>Hamilton County</i>										
Montlake Coal Co.-----	250	No. 10-----	1,650	36	64.92	26.34	8.74	-----	0.84	
New Soddy Coal Co. (Big S.)-----	200	No. 9-----	1,250	30	61.22	27.40	10.11	1.27	0.47	
New Soddy Coal Co. (Soddy)-----	600	No. 7-----	1,268	27	60.44	29.18	7.16	2.10	1.12	
Sale Creek Coal Co.-----	450	No. 2-----	875	42	60.29	31.27	7.02	1.42	0.60	
<i>Marion County</i>										
Battle Creek Coal & Coke Co.-----	463	Battle Creek--	1,550	24-312	59.77	34.74	5.12	0.02	0.17	
New Etna Coal Co.-----	250	Kelly-----	2,100	32	73.12	20.26	4.70	-----	-----	
Nunley Ridge Coal Co.-----	140	Sewanee-----	1,843	48	61.68	29.73	7.65	1.19	0.73	
Tennessee Consolidated Coal Co.-----	600	Sewanee-----	1,782	36	60.60	30.30	6.00	1.04	-----	
<i>Morgan County</i>										
Big Brushy Coal & Coke Co.-----	500	Brushy Mt.-----	1,750	40	56.60	36.82	3.60	1.46	1.52	
Bowling, H. B., Coal Co.-----	500	Coal Creek-----	1,000	58	55.72	40.89	2.12	0.79	1.10	
Eagle Coal Co.-----	50	Coal Creek-----	1,125	36	57.10	40.33	1.40	1.17	1.01	
Oliver Coal Co.-----	75	Coal Creek-----	800	48	50.71	44.81	2.15	0.25	2.08	
Poplar Creek Coal Co.-----	65	Coal Creek-----	1,150	44	54.08	41.16	2.64	2.12	1.69	
State of Tennessee-----	1,000	Brushy Mt.-----	1,620	33	62.31	32.32	5.37	-----	0.81	
<i>Overtown County</i>										
Brier Hill Collieries-----	225	Bon Air 2-----	1,700	40	62.45	30.83	5.54	1.09	1.56	
Obeys City Coal Co.-----	150	Bon Air 2-----	1,600	35	53.90	38.98	5.60	1.52	1.83	
<i>Rhea County</i>										
Fox Coal Co. 1-----	120	No. 2-----	950	240	60.57	34.23	3.77	1.43	0.51	
Fox Coal Co. 2-----	400	No. 5-----	1,250	30	60.24	28.97	9.45	1.34	0.82	
Dayton Coal & Iron Co.-----	500	Richland-----	985	22	59.20	31.00	12.40	-----	0.99	
<i>Roane County</i>										
Roane Iron Co.-----	650	Sewanee-----	1,082	54	53.76	30.13	15.96	-----	0.61	
<i>Scott County</i>										
Glen Mary Coal & Coke Co.-----	250	No. 4-----	1,470	30	61.63	36.73	1.64	-----	0.29	
John V. Lemoyne-----	100	No. 4-----	1,200	33	50.20	43.81	4.71	1.28	-----	
Paint Rock Coal Mining Co.-----	200	No. 5-----	1,300	27	57.00	37.00	3.25	2.00	0.60	
Pine Knot Coal Co.-----	150	No. 5-----	1,470	30	55.00	40.40	2.30	1.70	0.60	
Scott County Coal Co.-----	150	No. 4-----	1,500	32	53.14	35.76	8.04	1.26	1.80	
Stanley Coal Co.-----	275	No. 4-----	1,400	28	57.00	36.75	3.25	2.00	0.60	
<i>Sequatchie County</i>										
Southern Steel Co.-----	500	Sewanee-----	1,660	48	58.85	29.50	10.55	1.10	0.86	
<i>White County</i>										
Bon Air Coal & Iron Co.:-----										
{ Ravenscroft Mine-----	200	Bon Air-----	1,800	36	57.00	37.00	4.90	1.10	-----	
{ Bon Air Mine-----	1,100	No. 3-----	1,800	54	57.50	33.00	7.50	-----	2.00	
Clifty Creek Coal Co.-----	600	Sewanee-----	1,600	48	-----	-----	-----	-----	-----	

STRIKES AND SUSPENSIONS IN 1909

The following statement shows strikes and suspensions incident thereto at the coal mines in Tennessee during 1909, giving name and location of mine, number of men involved, number of days lost to each man, total number of days lost and cause assigned:

Strikes and suspensions incident thereto, in Tennessee coal mines in 1909.

COUNTY	NAME OF MINE	DURATION	Number of Men Involved	Number of Days Lost Per Man	Total Number of Days Lost	CAUSE ASSIGNED
Hamilton-----	Montlake ---	June-Aug -----	35	60	2100	Failure to recognize Union.
Scott-----	Glen Mary--	May 23-June 16	21	106	2226	Wage scale.

RECAPITULATION

Total number of days lost-----	4,326
Total wages lost to employes-----\$	9,171
Total loss in coal product (short tons)	11,853
Total loss in coal values-----\$	12,920

During 1908 the number of days lost was 1,560, total wages lost to employes \$3,338, total loss in coal product 4,259 short tons, and total loss in coal values \$4,855.

In addition to the above there was some short-time work at the Big Brushy Coal Co. mines at Petros on account of changing the character of labor employed, but no definite figures were given, and advices to the Department show that it was unimportant.

There were also a number of suspensions and much half-time work, arising from adverse trade conditions, which has to some extent disturbed the coal industry of the state since 1907.

It will be observed that losses attended by strikes have been reduced to a minimum, and that Tennessee is practically free from the many disturbing elements connected with vexatious labor problems, which have been more or less frequent in many other states of the union.

This wholesome condition of affairs has existed in Tennessee since 1905, for which both operator and miner should be congratulated.

COAL MINE ACCIDENTS IN TENNESSEE IN 1909

Owing to the numerous mine explosions occurring throughout the United States in 1909 and the appalling loss of life incident thereto, the question of accidents to mining employes and their prevention has been receiving more serious consideration by those in authority, and by the operators and miners as well, than ever before in the history of the mining industry. While the death rate for the United States during 1909 will show a decided increase on account of these sad disasters, there were only 31 fatal accidents in Tennessee coal mines in 1909, or 2.83 per cent per 1,000 employed.

As compared with 1908, this is a decrease of 3 accidents, and a decrease per 1,000 employed of 0.22 per cent. These accidents include all fatal accidents occurring to any employe at work in or around the coal mines, including serious accidents, terminating fatally after accident occurred.

The fatal accident rate in the coal mines of North America in 1908 per 1,000 employed was 3.96 per cent, while for the 20-year period, 1889-1908, it was only 3.13 per cent. When compared with Tennessee it will be observed that the death rate for Tennessee in 1908 was .91 per cent lower than the rate per 1,000 employed in North America, and .41 per cent lower than the average rate per 1,000 employed in North America for the 10-year period 1899-1908.

There were 6,207,483 short tons of coal mined during the year, which required the services of 10,946 employes, exclusive of those engaged in coke manufacture.

There were 200,241 short tons of coal mined for each life lost in 1909 as against only 178,908 short tons of coal mined for each life lost in 1908.

The causes of fatal accidents on account of falling substances amounted to 18, or 58 per cent; the causes on account of electric current 2, or 6.5 per cent; mine cars or motors 5, or 16.12 per cent; powder explosion 1, or 3.23 per cent; other minor causes 5 or 16.12 per cent. The percentage of deaths to entire accident frequency on account of falling substances in 1908 was 79 per cent, and in 1907 it was 65 per cent.

The deaths from falling substances in a majority of instances occur in rooms, and while they are often due to inexperienced men they are largely due to negligence on the part of the miner who becomes careless and fails to properly timber his working place so often advised by this department, as well as by the mine foreman and others in charge at the mines.

There was only one fatal accident occurring from powder explosion or windy shots during 1909, and in order that good results may continue to be obtained special attention is again called to the chief causes of blownout or windy shots, which are as follows: (1) The overcharge of powder; (2), overburdened shot when the resistance is too great; (3), the hole being too deep for the undercutting; (4), when shots are not properly tamped; (5), when coal is shot from the solid.

Since the passage of the present mining laws in 1903 the fatality rate in the coal mines of Tennessee has assumed normal proportions, but there are still more men being killed annually than should be, taking the coal tonnage as a basis, and operators should make renewed and determined efforts each year to lessen the dangers incident to mining, which can be done only through the vigorous enforcement of carefully prepared mining rules, and of mine discipline, adequate ventilation, and diligent as well as constant and intelligent attention to the condition of the roof by mine officials, and by a full appreciation on the part of the miner of the dangerous surroundings when the roof is not properly supported.

In order that the attention of those interested may be more particularly called to the important question of coal mining accidents, the following tables are submitted concerning the mining fatalities in Tennessee and in the United States and Canada, with such detailed statistics in reference thereto as appear interesting:

Table No. 1.—Showing fatal accidents in Tennessee coal mines in 1909, with name and occupation of person killed, by mines and counties, alphabetically arranged, experience in mining, station in life, number of children, and cause of accident.

Table No. 2.—Showing a general recapitulation of fatal accidents in Tennessee coal mines in 1909, giving number killed, by counties and districts, number by mine, number by occupation, and number by cause of accident.

Table No. 3.—Showing fatal accidents in Tennessee coal mines from 1894 to 1909, inclusive, giving number killed, number of wives made widows, number of children made fatherless, average number of employes, average number of employes to each life lost, total number of tons of coal mined, number of tons of coal mined for each life lost, and total number of tons of coal mined by each employe.

Table No. 4.—Showing non-fatal accidents in Tennessee coal mines in 1909, giving name of persons injured, by counties and mines, alphabetically arranged, date of accident, occupation, and cause and extent of injury.

Table No. 5.—Showing a general recapitulation of non-fatal accidents in Tennessee coal mines in 1909, giving the number injured by county, number by mines, number by occupation and number by cause of injury.

Table No. 6.—Showing fatal and non-fatal accidents in Tennessee coal mines in 1909, by causes of accidents, and by counties. It will be observed from this table that out of 228 accidents, 31, or 13.6 per cent, were fatal, which is practically one for every seventh accident occurring. It will also be observed that 116, or 51 per cent, occurred on account of falling substances, 13, or 5.7 per cent occurred from powder explosions and windy shots, 66, or 29 per cent occurred from mine cars or motors, one occurred from gas and dust explosion, and 32, or 14.3 per cent occurred from other causes. In those reported under other causes 2 were killed by electricity.

Table No. 7.—Showing fatal and non-fatal accident in the United States by causes of accidents by states. It will be observed from this table that in 1908 there were 9,222 accidents reported, of which 2,450 or 26.56 per cent were fatal, and 6,772 or 73.44 per cent non-fatal. For every fourth accident occurring there was one person killed, while in Tennessee in 1908 there was one person killed for every seventh accident occurring. Of the total accidents, 728 or 7.89 per cent occurred from gas and dust explosions, 263 or 2.85 per cent occurred from powder explosions and windy shots, 3,789 or 41.08 per cent occurred from falling substances and 4,442 or 48.17 per cent occurred from other causes.

Table No. 8.—Showing total number of fatal accidents in the coal mines of the United States and Canada from 1899 to 1908, inclusive, and also for the 10-year period 1899-1908, by states and provinces.

Table No. 9.—Showing number of persons killed per 1,000 employed in the coal mines of the United States and Canada by states and provinces from 1899 to 1908, inclusive, and also for the 10-year period 1899-1908. The average fatal accident rate in 1908 was 3.96 per cent per 1,000 employed, as against a total average rate for the 10-year period of 3.46 per cent. While these figures are slightly less than those in 1907, they still indicate the possibility of continued serious and disastrous results unless drastic and combined efforts are employed to lessen the causes of accidents.

Table No. 10.—Showing number of fatal accidents in the coal mines of the United States and Canada in 1908, compared with the average for the five preceding years, the

rate per 1,000 employed and the rate of increase or decrease per 1,000 employed, by states.

Table No. 11.—Showing a 20-year record of fatal accidents in the coal mines of the United States and Canada from 1889 to 1908, inclusive, also average accident rate for each 5-year period and average accident rate as a whole. The rate decreased during the first 5-year period 0.09 per cent, while for the third 5-year period it increased .66 per cent and for the last 5-year period it increased 0.4 per cent. The average rate for the 20-year period was 3.13 per cent, as against 3.96 per cent for 1908.

The statistical extracts embraced in tables 8, 9, 10 and 11 are from an able and attractive article written by Mr. Frederick L. Hoffman, an actuary and statistical expert of Newark, N. J., and appearing in the Engineering and Mining Journal of 505 Pearl Street, New York City.

Note: In addition to the coal mine accidents enumerated in the series of tables herein given, there were 8 fatal accidents and 94 non-fatal accidents at the copper mines in Folk County during 1909. All occurred at the Tennessee Copper Company mines, except John Wimberly, who was killed at the mines of the Ducktown Sulphur and Copper Company. The fatal accidents at the Tennessee Copper Company mines were John Bascses, S. Brannon, George Cable, W. H. Clouts, Luther Duggan, T. J. Kinsey and H. W. Walker. A large number of non-fatal accidents of the Tennessee Copper Company were very trivial in their nature and but little time lost.

Table No. 1.—This table shows fatal accidents in Tennessee coal mines in 1909, arranged alphabetically by counties and mines, giving name and occupation of persons killed, experience in mining, and cause of accident.

Fatal accidents in Tennessee coal mines in 1909, by counties and mines.

NAME OF COUNTY AND MINE	NAME OF PERSON KILLED	Date of Accident	Occupation	Experience	Married or Single	Number of Children	CAUSE OF ACCIDENT
<i>Anderson Co.</i>							
Cross Mt. 3	W. B. Underwood	Oct. 29	Miner	5 yrs	M	1	Heart failure.
Thistle 1	A. G. Cook	May 13	Miner	12 yrs.	M	2	Fall of roof.
<i>Bledsoe Co.</i>							
Atpointley 2	Eschol Cooley	Jan. 8	Miner	4 years	M	1	Fall of roof.
<i>Campbell Co.</i>							
Cambria	Tom Johnson	April 9	Haulage	1 year	S		Mine cars.
Careyville	H. M. McBee	Nov. 18	Miner	Years.	M	2	Fall of roof.
Falls Branch	Sam Bates	Aug. 3	Trapper		S		Mine cars.
Rex 1	W. W. Reese	Dec. 22	Miner	28 yrs.	M	2	Fall of roof.
Rex 2	W. H. Hunneycutt	Sept. 21	Shot firer	2 years	M	6	Powder explosion.
Rex 2	Robert Lovely	Nov. 16	Haulage	3 years	S		Mine cars.
Rex 2	Frank Rorex	Oct. 1	Miner	2 years	M	1	Fall of roof.
Southern 2	Richard Loman	Oct. 14	Miner	3 years	M		Powder explosion.
Tenn-Jellico	Scott Kincaid	July 27	Miner	18 yrs.	S		Powder explosion.
Whistle Creek	Will Powers	Sept. 16	Miner	2 yrs.	S		Fall of roof.
Zechini	Wed Weaver	Sept. 20	Weighman	9 yrs	M	9	Weigh box.
Zechini	Shadrack Hodge	Dec. 27	Miner	Years	M		Heart failure.
<i>Clatsborne Co.</i>							
Fork Ridge 2	Emmett Clawson	Aug. 28	Miner	Years	M	3	Electric current.
Fork Ridge 2	Tom Martin	Mar. 11	Trapper	3 days	S		Motor.
Fork Ridge	Toney Rimesa	June 29	Miner	18 yrs.	M	5	Electric current.
Mingo 5	S. Medley	July 23	Haulage	8 days	S		Monitor car.
Nicholson 3	A. J. Mack	May 5	Miner	Years	M		Fall of roof.
Pruden	Kelly Gaylor	Feb. 3	Miner	2 mos.	S		Fall of roof.
Reliance 1	Zack Price	Nov. 25	Trapper	8 mos.	S		Fall of roof.
Sterling	Robert Wilson	April 20	Miner	1 day	S		Fall of roof.
<i>Grundy Co.</i>							
Flat Branch	Taylor Smith	Sept. 23	Miner	Years	S		Fall of roof.
Reid Hill	Ben Gilley	Dec. 9	Miner	25 yrs.	M	5	Fall of roof.
<i>Hamilton Co.</i>							
Montlake	E. M. Cooper	Jan. 9	Miner	10 yrs.	M	4	Fall of roof.
<i>Marion Co.</i>							
New Etna 4	Fred Bedow	June 5	Miner	1 mo.	M		Fall of roof.
<i>Morgan Co.</i>							
Bowling 2	Ed. Bailey	Sept. 14	Miner	7 yrs.	M		Fall of roof.
Brushy Mt.	Dave Pinkney	Feb. 9	Miner		S		Fall of roof.
Brushy Mt.	John King	Mar. 9	Miner		S		Fall of roof.
<i>White Co.</i>							
Bon Air (Shaft)	C. Simmons	Dec. 13	Laborer	4 yrs.	M	2	Fall of roof.

Table No. 2.—This table is a general recapitulation of fatal accidents in Tennessee coal mines in 1909, showing number, by counties and districts, number by name of mine, and number by occupation and causes of accident.

Recapitulation of fatal accidents in Tennessee coal mines in 1909.

COUNTY	No.	NAME OF MINE	No.	OCCUPATION	No.	CAUSE OF ACCIDENT	No.
Anderson	2	Atpontley 2	1	Haulage	6	Electric current	2
Bledsoe	1	Bon Air (Shaft)	1	Laborer	1	Fall of roof or coal	18
Campbell	12	Bowling 2	1	Miner	22	Heart failure	2
Clalborne	8	Brushy Mt.	2	Shot firer	1	Mine Cars or motors	5
Grundy	2	Cambria	1	Weighman	1	Powder explosion	1
Hamilton	1	Careyville	1			Powder cartridge	
Marion	1	Cross Mt. 3	1			Explosion	1
Morgan	3	Falls Branch	1			Powder keg explosion	1
White	1	Flat Branch	1			Weigh box	1
		Fork Ridge 2	2				
		Fork Ridge 3	1				
		Mingo 5	1				
		Montlake	1				
		New Etna 4	1				
		Nicholson 3	1				
		Pruden	1				
		Reid Hill	1				
		Reliance 1	1				
		Rex 1	1				
		Rex 2	3				
		Southern 2	1				
		Sterling	1				
		Tenn-Jellico	1				
		Thistle 1	1				
		Whistle Creek	1				
		Zechini	2				
Total	31	Total	31	Total	31	Total	31

RECAPITULATION.

First District

Bledsoe	1
Grundy	2
Marion	1
White	1
Total	5

Second District.

Hamilton	1
Morgan	3
Total	4

Third District.

Anderson	2
Campbell	12
Clalborne	8
Total	22
Grand Total	31

Table No. 3.—This table gives miscellaneous statistics of fatal accidents in the coal mines of Tennessee from 1894 to 1909, inclusive, showing total number killed, number of wives made widows, number of children rendered fatherless, total average number of employees, number of employees to each life lost, total number of tons of coal mined, and total number of tons of coal mined to each employee.

General statistics of fatal accidents in Tennessee coal mines, 1894-1909.

YEAR	Number killed	Number of wives made widows	Number of children made fatherless	Total average number of employees	Average number of employees to each life lost	Coal mined (short tons)	Coal mined to each life lost (short tons)	Coal mined by each employee (short tons)
1894.....	12	6	16	5,542	461	2,180,879	181,740	393.52
1895.....	a37	19	50	5,120	138	2,319,720	62,695	453.07
1896.....	22	12	29	6,531	296	2,663,714	121,078	407.85
1897.....	10	6	13	6,337	633	2,880,994	288,099	454.63
1898.....	18	10	24	7,820	411	3,084,748	162,499	394.40
1899.....	20	11	27	7,694	384	3,736,134	186,806	485.50
1900.....	10	6	13	8,691	869	3,904,048	390,404	453.50
1901.....	b44	20	62	8,418	191	3,785,672	86,038	449.70
1902.....	c226	137	324	8,759	39	4,232,332	18,727	483.20
1903.....	26	13	26	9,673	372	4,810,758	185,029	499.40
1904.....	28	10	16	9,972	356	4,847,242	173,123	486.08
1905.....	29	13	30	10,517	363	5,552,576	191,468	527.96
1906.....	33	16	41	10,736	325	6,272,457	190,077	584.24
1907.....	31	19	51	11,098	358	6,940,911	223,900	625.42
1908.....	34	23	47	11,122	327	6,082,851	178,908	547.00
1909.....	31	18	32	10,946	343	6,207,483	200,241	567.08

a Twenty-five of these were killed by coal dust explosion at the Dayton Coal & Iron Company mines, at Dayton.

b Twenty of these were killed in the explosion of the Richland mine at Dayton, operated by the Dayton Coal & Iron Company.

c Two hundred of these were killed in the explosion of Nelson and Fraterville mines at Coal Creek, operated by the Coal Creek Coal Company.

The fatal accident death rate in Tennessee in 1909 per 1,000 employed was 2.83 per cent, while in 1908 the rate was 3.05 per cent.

There was only one person killed for every 343 employees in 1909, while in 1908 there was one killed for every 327 employees.

There were 200,241 short tons of coal mined for each life lost in 1909, when in 1908 there were only 178,908 short tons of coal mined for each life lost.

Each employee produced 567.08 short tons of coal during 1909, whereas, during 1908 each employee only produced 547 short tons of coal.

Table No. 4.—This table shows non-fatal accidents in Tennessee coal mines in 1909, by counties and mines, alphabetically arranged, name and occupation of person injured, and date, cause and extent of injury.

Non-fatal accidents in Tennessee coal mines in 1909, by counties and mines.

COUNTY AND MINE	NAME OF PERSON INJURED	DATE OF ACCIDENT	OCCUPATION	CAUSE AND EXTENT OF INJURY
<i>Anderson County</i>				
Black Diamond 1	James Leek	Mar. 23	Miner	Fall of roof; hand cut.
Black Diamond 5	Herbert Childress	Mar. 25	Timber	Timbers; 2 fingers hurt.
Black Diamond 5	J. M. Childress	Sept. 22	Miner	Fall of roof; 2 toes off.
Black Diamond 5	Lem Kincald	May 21	Miner	Fall of roof; hips and back.
Black Diamond 6	W. R. Haynes	Jan. 21	Miner	Ankle sprained.
Buck Mt.	Alfred Selber	Dec. 31	Miner	Fall of coal; foot fracture.
Campbell 2	George Duncan	Oct. 2	Machinist	Mine car; back.
Campbell 2	James Felker	Aug. 30	Track	Fall of roof; ankle.
Campbell 2	John Pankey	Nov. 27	Miner	Timbering; knee hurt.
Campbell 2	John Russell	Feb. 5	Miner	Mine cars; foot.
Campbell 2	John Timber	Feb. 11	Miner	Fall of coal.
Campbell 2	F. M. Winningham	Dec. 15	Miner	Fall of coal.
Campbell 3	Dan Halburnt	Feb. 3	Miner	Timbers; foot.
Campbell 3	Henry Halburnt	Dec. 18	Miner	Fall of coal; toe.
Campbell 3	Henry Ledford	Apr. 28	Miner	Fall of coal; knee.
Campbell 4	Jack Felker	Jan. 6	Haulage	Cars; sprained ankle.
Campbell 4	Alex Hammonds	Sept. 8	Laborer	Struck on hand by pick.
Campbell 4	Alonzo Naff	June 9	Haulage	Cars; foot bruised.
Cross Mt. 1	John Blizzard	Nov. 30	Haulage	Cars; fingers.
Cross Mt. 1	Harry Evans	Aug. 26	Motor	Motor; shoulder bruised.
Cross Mt. 1	Dave Robbins	July 30	Miner	Prop; leg bruised.
Cross Mt. 3	A. T. Phillips	Mar. 16	Miner	Prop; rib fractured.
Middle Ridge	Kelly Cooper	Nov. 16	Haulage	Cars; leg bruised.
Middle Ridge	A. Eldridge	Nov. 3	Haulage	Cars; thumb.
Middle Ridge	J. H. Johnson	Nov. 26	Miner	Fall of roof; back.
Middle Ridge	D. C. Smith	Nov. 22	Miner	Fall of roof; foot.
Tennessee	George Cornwell	Mar. 9	Miner	Fall of roof; ankle dislocated.
Tennessee	George Disney	Dec. 8	Contractor	Fall of roof; leg.
Tennessee	Ed. Duncan	Feb. 2	Laborer	Fall of roof; leg broken.
Tennessee	John Garner	July 12	Miner	Cars; hip bruised.
Tennessee	Larkin Lee	Dec. 16	Haulage	Cars; leg bruised.
Tennessee	A. J. McFarland	Dec. 13	Laborer	Timbers; foot hurt.
Tennessee	Jordan Moore	Feb. 23	Miner	Cars; pelvis broken.
Tennessee	R. H. Scarborough	Feb. 1	Machinist	Drill press; finger lost
Tennessee	Mynatt Sharp	Mar. 2	Haulage	Cars; leg broken.
Windrock 1	Moses Austin	Oct. 23	Miner	Car; finger lost.
Windrock 1	Will Black	Dec. 4	Miner	Car; finger hurt.
Windrock 1	Will Brashears	Sept. 20	Miner	Fall of roof; mashed.
Windrock 1	Bud Hill	July 24	Miner	Fall of coal; finger cut.
Windrock 1	Harvey Newcomb	Aug. 7	Miner	Car; finger mashed.
Windrock 1	Burris Stallings	June 30	Miner	Fall of roof; legs.
<i>Campbell County</i>				
Cambria	John Pickle	Aug. 10	Miner	Fall of roof; leg broken.
Careyville	R. L. Bilbrey	Sept. 15	Miner	Fall of roof; back.
Careyville	J. C. Cooper	June 22	Miner	Fall of roof; rib broken.
Careyville	Henry Gaines	June 16	Haulage	Mule kick; jaw broken.
Careyville	Sam Raddix	July 29	Miner	Car; leg broken.
Careyville	William Ross	April 23	Miner	Fall of roof; hips.
Chaska	H. F. Brannam	May 19	Haulage	Motor; back hurt.
Chaska	Sam Ford	July 24	Haulage	Fall of roof; arm.
Chaska	William Houston	June 22	Miner	Fall of roof; shoulder dislocated.
Chaska	James Lay	Feb. 26	Miner	Fall of roof; back, hips.

Table No. 4—Non-fatal accidents in Tennessee coal mines in 1909—continued.

COUNTY AND MINE	NAME OF PERSON INJURED	DATE OF ACCIDENT	OCCUPATION	CAUSE AND EXTENT OF INJURY
<i>Campbell Co.—Con.</i>				
Ohaska	James Lay	May 9	Miner	Fall of roof; hip cut.
Davis Creek	Dennis Anthony	July 28	Miner	Windy shot.
Evans	Will Adkins	Sept. 21	Miner	Fall of roof; arm.
Evans	Aaron Morgan	July 26	Miner	Fall of roof; back.
Gem	A. J. Bange	April 10	Miner	Cars; leg broken.
Gem	M. H. Pierce	Jan. 14	Miner	Fall of roof; foot and knee.
Gem	Scott Powell	May 25	Miner	Fall of roof; back.
Indian Mt.	John Beckner	June 16	Miner	Fall of roof; ankle dislocated.
Indian Mt.	Manuel Bush	Nov. 16	Miner	Fall of roof; ankle.
Indian Mt.	J. C. Gurley	Oct. 6	Miner	Fall of roof; leg broken.
Italian B. G.	E. Filippini	Aug. 24	Miner	Timbers; leg hurt.
Italy	Willie Clontz	Aug. 18	Miner	Fall of roof; knee.
Jackson	Frank Allen	Aug. 13	Trapper	Cars; 2 fingers off.
Jackson	Oscar Dyer	Aug. 16	Miner	Fall of roof; lost toe.
Jackson	Curtis Fortune	June 24	Haulage	Cars; knee.
Jackson	George Price	Oct. 18	Driver	Mule kick; face cut.
Kimberly	Jack Tevil	Nov. 27	Miner	Fall of roof; side.
Kimberly	James Wilburn	Sept. 15	Miner	Fall of roof; back.
Layne B. G.	Charles Cecdi	Oct. 13	Miner	Fall of roof; collar bone.
Red Ash	Oscar Cobb	Aug. 24	Driver	Cars; back sprained.
Rex 1	J. W. Richardson	Jan. 27	Miner	Fall of roof; leg broken.
Southern 2	Joe Felost	Aug. 27	Miner	Fall of roof; leg broken.
Southern 2	Sam McCay	Oct. 14	Miner	Powder keg explosion; slight.
Sun	Grafton Setzer	Dec. 3	Miner	Jumped from monitor car.
Tenn-Jellico	Archie Ross	July 27	Miner	Power explosion; face and arms.
Westbourne	Frank Day	Aug. 18	Miner	Fall of roof; back.
Westbourne	Joe Seefridge	Nov. 3	Machine R	Cars; foot bruised.
Westbourne	Whit Smith	Nov. 9	Machine R	Fall of roof; hip and ankle.
Zechini	Charley Cuppelli	Dec. 22	Miner	Fall of roof; face.
Zechini	General Fields	Aug. 14	Trapper	Fall of roof; leg hurt.
Zechini	Wil Fields	Sept. 17	Driver	Mule; leg hurt.
Zechini	C. W. Hicks	June 24	Driver	Fall of roof; back.
Zechini	George Wippel	Dec. 16	Miner	Fall of roof; leg.
<i>Claiborne County</i>				
Buffalo	Jean Dixon	May 20	Laborer	Cars; fingers mashed.
Buffalo	R. J. Mackey	Mar. 18	Miner	Fall of roof; foot.
Buffalo	H. E. Malone	May 22	Miner	Powder explosion.
Buffalo	T. Roebuck	April 5	Miner	Fall of coal; hand cut.
Fork Ridge	Will Cooper	June 17	Miner	Fall of coal; back.
Fork Ridge	Tom Cox	April 14	Miner	Powder explosion.
Fork Ridge	J. C. Tinsly	Nov. 22	Driver	Cars; ankle and leg.
Fork Ridge	V. Gordon	Feb. 23	Trapper	Motor; leg bruised.
Fork Ridge	Lee Hash	Oct. 5	Motor	Cars; hip bruised.
Fork Ridge	O. P. Hatfield	April 14	Coupler	Car; legs bruised.
Fork Ridge	Stephen Heel	April 16	Miner	Fall of roof; collar bone.
Fork Ridge	W. F. Hollman	Feb. 17	Miner	Cars; knee and ankle.
Fork Ridge	John Maloy	Jan. 12	Machine R	Machine; hip and back.
Fork Ridge	George Mink	Nov. 9	Driver	Mule kick; hips.
Fork Ridge	J. H. Mirack	Oct. 7	Miner	Fall of coal; toes.
Fork Ridge	Mitt Owens	Sept. 13	Miner	Fall of roof; leg.
Fork Ridge	Jim Ramsey	June 24	Miner	Fall of roof; back and ankle.
Fork Ridge	Clem Riley	Mar. 17	Miner	Fall of roof; ribs.
Fork Ridge	L. M. Stimpson	Oct. 23	Miner	Fall of coal; knee.
Fork Ridge	John Sweet	Jan. 12	Miner	Fall of roof; leg.
Fork Ridge	John Sweet	May 5	Miner	Cars; rib fractured.
Fork Ridge	Arch Tolliver	July 2	Miner	Fall of roof; leg broken.
Fork Ridge	R. F. Velles	May 17	Machine R	Machine; shoulder.

Table No. 4—Non-fatal accidents in Tennessee coal mines in 1909—continued.

COUNTY AND MINE	NAME OF PERSON INJURED	DATE OF ACCIDENT	OCCUPATION	CAUSE AND EXTENT OF INJURY
<i>Claiborne Co.—Con.</i>				
Fork Ridge	T. J. Warren	Mar. 16	Slate boss	Fall of roof; foot.
Fork Ridge	George Weaver	June 28	Miner	Fall of roof; back.
Fork Ridge	Steve Woolsock	April 16	Miner	Cars; foot.
Fork Ridge	John Woolum	Nov. 13	Miner	Incline car; hips.
King Mt.	Lowe Cox	Jan. 5	Miner	Fall of coal; foot.
King Mt.	Will Davis	Aug. 16	Miner	Fall of roof; back.
King Mt.	Jo. Gettsinger	April 14	Miner	Fall of roof; back.
King Mt.	Henry Heton	Dec. 30	Driver	Cars; leg.
King Mt.	French Lach	Dec. 30	Miner	Fall of roof; leg.
King Mt.	Robert Mack	Oct. 21	Miner	Fall of roof; hips.
King Mt.	E. Tharp	Oct. 21	Miner	Fall of roof; back.
Nicholson	C. C. Carter	Nov. 26	Tipple	Tipple car; ear cut.
Nicholson	Will Harris	Sept. 13	Driver	Car; arm and back.
Nicholson	Dan Kirder	Mar. 4	Driver	Fall of roof; arm and thigh.
Nicholson	W. McKinny	June 23	Miner	Car; foot bruised.
Nicholson	Pink Mitchell	Jan. 4	Miner	Powder explosion.
Nicholson	P. Rogers	Jan. 9	Miner	Fall of roof; thigh.
Nicholson	Sam Sharpe	April 21	Driver	Cars; knee and leg.
Nicholson	Lawrence Young	Jan. 14	Miner	Fall of coal; back.
Pruden	Geo. W. Allman	Feb. 3	Miner	Fall of roof; legs broken.
Pruden	John Crutchfield	Jan. 27	Miner	Fall of roof; scalp.
Pruden	John Crutchfield	Aug. 24	Miner	Cars; back and hip.
Pruden	Henry Hackney	Mar. 5	Driver	Fall of roof; back.
Pruden	G. J. Johnson	Aug. 24	Miner	Fall of roof; side.
Pruden	James Osborne	Aug. 12	Miner	Fall of roof; leg fractured.
Pruden	John Read	Mar. 30	Miner	Fall of roof; head and back.
Pruden	Jesse Smiddy	April 26	Driver	Car; foot fractured.
Pruden	J. B. Williams	Sept. 23	Miner	Fall of roof; back and hips.
Standard	Martin White	Dec. 8	Track	Car; hips and back.
Yellow Creek 2	George Cato	Dec. 18	Miner	Fall of roof; back.
Yellow Creek 2	Thos. W. Jones	Dec. 22	Miner	Fall of roof; back.
Yellow Creek 3	G. C. Burnett	Sept. 20	Miner	Fall of roof; back.
<i>Cumberland Co.</i>				
Clear Creek	W. H. Bess	Sept. 18	Miner	Machine; rib broken.
Clear Creek	Louis Neal	Aug. 12	Miner	Car; finger broken.
<i>Fentress County</i>				
Fentress	J. M. Norris	June 3	Miner	Fall of roof; back.
<i>Grundy County</i>				
Coalmont B	Jas. Anderson	Dec. 27	Miner	Fall of roof; ankle.
Coalmont B	W. B. Head	Nov. 24	Tripple	Cars; leg and knee.
Coalmont B	Will Smith	Aug. 20	Miner	Powder explosion, cartridge.
<i>Hamilton County</i>				
Montlake	E. O. Bryant	Dec. 3	Miner	Fall of roof; leg bruised.
New Soddy 1-2	John Baggett	July 9	Miner	Powder explosion.
New Soddy 1-2	Tim Bean	July 9	Miner	Powder explosion; side.
New Soddy 1-2	Eli Graham	Dec. 22	Miner	Fall of roof; collar bone.
New Soddy 1-2	Thomas Rees	Dec. 28	Trapper	Cars; leg broken.
New Soddy 1-2	F. V. Sullivan	Dec. 21	Track	Cars; foot bruised.
<i>Marion County</i>				
Battle Creek	William Thompson	Aug. 30	Driver	Mule ran away; leg hurt.
<i>Morgan County</i>				
Babahatchie	Moss Brown	Mar. 1	Driver	Fall of roof; arm slight.
Big Mt.	Frank Taylor	Nov. 15	Driver	Mule kick; jaw bone broken.
Bowling 1	Ewel White	April 20	Mucker	Cars; foot and heel.
Brushy Mt. 1	Waddell Hawkins	May 11	Miner	Fall of roof; shoulder dislocated.
Brushy Mt. 3	Jo. Burk	Jan. 15	Miner	Fall of roof; internal.
Brushy Mt. 3	Will Elliott	Sept. 17	Motor	Motor; foot mashed.

Table No. 4—Non-fatal accidents in Tennessee coal mines in 1909—continued.

COUNTY AND MINE	NAME OF PERSON INJURED	DATE OF ACCIDENT	OCCUPATION	CAUSE AND EXTENT OF INJURY
<i>Morgan Co.—Con.</i>				
Brushy Mt. 3	Henry Harris	April 15	Miner	Fall of roof; back.
Brushy Mt. 3	Ed Inman	May 25	Driver	Cars; foot mashed.
Brushy Mt. 3	Elbert Pratt	April 3	Miner	Fall of roof; ribs and back.
Brushy Mt. 3	John Pruitt	Dec. 21	Miner	Car; toe mashed.
Brushy Mt. 3	B. Smith	Sept. 10	Miner	Fall of roof; internal.
Brushy Mt. 3	Fletch Taylor	July 13	Slate	Fall of roof; leg broken.
Brushy Mt. 3	Robert White	July 23	Miner	Fall of roof; leg broken.
Poplar Creek	Hiram Braden	June 4	Miner	Fall of roof; leg.
Poplar Creek	C. B. Clark	Oct. 19	Miner	Timber; eye cut.
Poplar Creek	A. E. Myers	Sept. 17	Miner	Cars; foot mashed.
<i>Overton County</i>				
Brier Hill 1	Ben Gardner	Feb. 8	Trip rider	Cars; thigh bruised.
Brier Hill 1	M. Isbell	Mar. 13	Miner	Cars; foot mashed.
Obey City 1	E. T. Bramlett	Dec. 24	Miner	Tipple; fell through.
<i>Rhea County</i>				
New Prospect	Dave Day	Sept. 17	Miner	Fall of roof; leg and shoulder.
New Prospect	Albert Lander	Oct. 14	Miner	Fall of roof; arm and leg.
New Prospect	Ed Neil	July 23	Rope rider	Rope; side hurt.
New Prospect	George Stokes	July 15	Rope rider	Rope; finger hurt.
New Prospect	Elgie Wilkey	Sept. 20	Laborer	Gas explosion; hands, face.
Richland 13-14	Walt Best	July 28	Driver	Cars; hand mashed.
Richland 13-14	Jim Collier	Mar. 8	Miner	Powder explosion; neck.
Richland 13-14	Oscar Deal	July 13	Trapper	Mule; leg broken.
Richland 13-14	N. L. Henry	Sept. 7	Tipple	Timbers, eye cut.
Richland 13-14	Earn Moore	May 31	Laborer	Cars; hip bruised.
Richland 13-14	D. Morgan	Aug. 24	Driver	Cars; ankle bruised.
Richland 13-14	Lee Smith	Dec. 10	Driver	Cars; ankle and foot.
Richland 13-14	Berry White	Mar. 15	Miner	Fall of roof; shoulders.
<i>Roane County</i>				
Old	John Jones	Oct. 30	Miner	Fall of roof; back.
Old	Louis Milsaps	Oct 28	Driver	Cars; back.
<i>Scott County</i>				
Lehigh 5	W. R. Cecil	Aug. 6	Miner	Cars; ankle.
Lehigh 5	Ottis Elliott	April 1	Miner	Cars; wrist.
Lehigh 5	John Honeycutt	April 6	Miner	Cars; finger.
<i>Squatchie County</i>				
Douglass 2	Lawrence Camp	Nov. 9	Laborer	Cars; finger.
Douglass 2	P. E. Murphy	Nov. 11	Holsting E.	Fall of roof; leg mashed.
<i>White County</i>				
Bon Air 6	Agrelle Agran	June 4	Miner	Fall of roof; slight.
Bon Air 6	Isham Davis	May 11	Laborer	Fall of roof; leg broken.
Bon Air 6	Waman Prater	May 13	Driver	Car wreck; slight.
Bon Air 6	Lee Rogers	Dec. 6	Miner	Fall of roof; foot.
Bon Air 6	Willie Waters	Mar. 24	Greaser	Car; leg bumped.
Clifty Creek 3	Newt West	Oct. 3	Miner	Car; foot mashed.

Table No. 5.—This table is a general recapitulation of non-fatal accidents in Tennessee coal mines in 1909, showing number by counties, number by mines, number by occupation and number by causes of accident.

Recapitulation of non-fatal accidents in Tennessee coal mines in 1909.

COUNTY	No.	NAME OF MINE	No.	OCCUPATION	No.	CAUSE OF ACCIDENT	No.
Anderson	41	Babahatchie	1	Contractor	1	Falling roof or coal	98
Campbell	43	Battle Creek	1	Greaser	1	Gas and coal dust	
Claiborne	55	Big Mt.	1	Haulage	41	explosion	1
Cumberland	2	Black Diamond 1.	1	Holsting Eng.	1	Powder explosions and	
Fentress	1	Black Diamond 5.	3	Laborer	8	windy shots	10
Grundy	3	Black Diamond 6.	1	Machinists	2	Mine cars or motors	63
Hamilton	6	Bon Air 6	5	Machine miners	4	Mining machines	3
Marion	1	Bowling 1	1	Miners	126	Mule	7
Morgan	16	Brier Hill	2	Motormen	3	Pick	1
Overton	3	Brushy Mt. 1.	1	Muckers	1	Rope	2
Rhea	13	Brushy Mt. 3.	9	Slate	2	Timbers	9
Roane	2	Buck Mt.	1	Timbermen	1	Tipple	1
Scott	3	Buffalo	4	Tipplemen	3	Minor causes	2
Sequatchie	2	Cambria	1	Trackmen	3		
White	6	Campbell 2	6				
		Campbell 3	3				
		Campbell 4	3				
		Careyville	5				
		Chaska	5				
		Clear Creek	2				
		Clifty Creek 3	1				
		Coalmont B	3				
		Cross Mt. 1	3				
		Cross Mt. 3	1				
		Davis Creek	1				
		Douglass 2	2				
		Evans	2				
		Fentress	1				
		Fork Ridge	23				
		Gem	3				
		Indian Mt.	3				
		Italian B. G	1				
		Italy	1				
		Jackson	4				
		Kimberly	2				
		King Mt.	7				
		Layne B. G	1				
		Lehigh 5	3				
		Middle Ridge	4				
		Montlake	1				
		New Prospect	5				
		New Soddy	5				
		Nicholson	8				
		Obey City 1	1				
		Old	2				
		Poplar Creek	3				
		Pruden	9				
		Red Ash	1				
		Rex 1	1				
		Richland 13-14	8				
		Southern 2	2				
		Standard	1				
		Sun	1				
		Tennessee	9				
		Tenn-Jellico	1				
		Westbourne	3				
		Windrock 1	6				
		Yellow Creek 2	2				
		Yellow Creek 3	1				
		Zechini	5				
Total	197	Total	197	Total	197	Total	197

Table No. 6.—This table shows causes of fatal and non-fatal accidents in Tennessee coal mines in 1909 by counties:

Causes of fatal and non-fatal accidents in Tennessee coal mines in 1909.

COUNTY	Fall of Roof or Coal		Gas & Dust Explosions		Powder Explosions & Windy Shots		Mine Cars and Motors		Other Causes		Total	
	Killed	Injured	Killed	Injured	Killed	Injured	Killed	Injured	Killed	Injured	Killed	Injured
Anderson	1	17						15	1	9	2	41
Bledsoe	1										1	
Campbell	4	28			3	3	3	7	2	5	12	43
Claiborne	4	32				3	2	16	2	4	8	55
Cumberland								1		1		2
Fentress		1										1
Grundy	2	1				1		1			2	3
Hamilton	1	2				2		2			1	6
Marion	1									1	1	1
Morgan	3	9						5		2	3	16
Overton								2		1		3
Rhea		3		1		1		4		4		13
Roane		1						1				2
Scott												3
Sequatchie		1						3				2
White	1	3						3			1	6
Total	18	98		1	3	10	5	61	5	27	31	197

a Electric Current.

Table No. 7.—In this table is shown the causes of fatal and non-fatal accidents in the coal mines of the United States in 1908, by states:

Causes of fatal and non-fatal accidents in the coal mines of the United States in 1908.

STATES	Gas & Dust Explosions		Powder Explosions & Windy Shots		Falls of Roof or Coal		Other Causes		Total	
	Killed	Injured	Killed	Injured	Killed	Injured	Killed	Injured	Killed	Injured
Alabama	9	12	2	1	39	14	58	31	108	58
Arkansas	1	8	1	1	8	10	4	24	14	43
Colorado	5	8	2	1	39	57	15	49	61	115
Illinois a	9	33	25	39	93	404	56	343	183	819
Indiana	5	33		3	20	212	20	582	45	830
Iowa	1		2	6	19	49	9	35	31	90
Kansas	7	20			14	15	6	35	27	70
Kentucky	9	1	3	4	17	42	10	80	39	127
Maryland a				2	4	55	8	39	12	96
Michigan			1	10	4	45		46	5	101
Missouri					9	24	1	12	10	36
Montana		6	1	5	7	25	12	22	20	58
New Mexico		6	1	6	15	6	7	6	23	6
North Dakota				2	2	1	2	1	4	4
Ohio	2	9	4	24	72	273	35	292	113	598
Oklahoma a	3	21	3	4	2	19	36	84	44	128
Pennsylvania:										
{ Anthracite	57	130	23	46	284	328	314	666	678	1170
{ Bituminous	162	20	1	21	263	557	146	421	572	1019
Tennessee		6	1	10	27	91	6	88	34	195
Utah	2	2		2	2	10	4	114	8	128
Washington	1	14		2	12	19	12	44	25	79
West Virginia	63	9	4	6	153	431	93	496	313	942
Wyoming	60				2	1	19	65	81	66
Total	396	332	74	189	1107	2682	873	3569	2450	6772

a Fiscal Year. b Not reported.

Table No. 8.—This table shows number of persons killed by accident in coal mines of North America from 1899 to 1908, inclusive.

Fatal accidents in coal mines of North America, 1899-1908.

STATES TERRITORIES AND PROVINCES	1899	1900	1901	1902	1903	1904	1905	1906	1907	1908	1899 TO 1908
Alabama.....	40	37	41	50	57	84	185	96	154	110	854
Colorado.....	41	29	55	73	40	89	59	88	99	61	634
Illinois <i>c</i>	84	94	99	99	156	157	199	155	165	175	1383
Indiana.....	16	18	24	24	55	34	47	31	53	45	347
Iowa <i>c</i>	20	29	26	55	21	31	24	37	35	38	316
Kansas.....	16	22	26	27	36	616	36	30	32	<i>a</i>	241
Kentucky.....	7	17	21	19	25	19	31	39	32	40	250
Maryland.....	5	7	12	11	13	12	13	7	<i>a</i>	12	92
Michigan.....	64	10	6	6	8	7	8	6	7	6	68
Missouri.....	14	10	15	10	17	11	11	16	8	10	122
New Mexico <i>c</i>	15	25	9	17	17	15	5	9	31	34	167
Ohio.....	57	68	72	81	114	118	131	127	153	112	1033
Oklahoma.....	25	40	44	60	33	30	44	39	32	44	391
Pennsylvania:											
Anthracite.....	461	411	513	300	518	595	644	557	708	678	5385
Bituminous.....	258	265	301	456	402	536	479	477	806	572	4552
Tennessee.....	20	10	53	226	26	28	29	33	31	34	490
Utah.....		209	10	8	7	9	7	7	8	8	273
Washington.....	45	33	27	34	25	31	13	13	36	25	282
West Virginia <i>c</i>	89	141	134	120	159	140	194	268	356	625	2226
British Columbia.....	11	17	102	139	42	37	12	15	31	18	424
Nova Scotia.....	19	21	14	19	31	19	20	28	35	39	245
Total deaths.....	1,247	1,503	1,604	1,834	1,802	2,018	2,191	2,077	2,812	2,686	19,775

a—Returns not available.

b—Six months only.

c—Year ended June 30, 1908.

Table No. 9.—This table shows number of persons killed per 1,000 employed in the coal mines of North America from 1899 to 1908, inclusive:

Fatal accident rates per 1,000 employed in coal mines of North America, 1899-1908.

STATES TERRITORIES AND PROVINCES	1899	1900	1901	1902	1903	1904	1905	1906	1907	1908	1899 TO 1908
Alabama.....	3.10	2.59	2.90	2.79	2.94	4.71	10.74	5.23	7.61	5.86	4.99
Colorado.....	5.60	3.99	6.88	8.11	3.89	8.26	4.96	7.32	7.67	4.25	6.11
Illinois <i>c</i>	2.27	2.39	2.24	2.15	3.13	2.87	3.36	2.49	2.47	3.59	2.72
Indiana.....	2.07	1.82	1.98	1.83	3.64	2.70	2.53	1.61	2.79	2.36	2.37
Iowa <i>c</i>	2.49	2.22	1.97	4.23	1.59	1.90	1.36	2.20	2.05	2.20	2.17
Kansas.....	1.57	2.06	2.28	2.70	3.61	63.09	2.97	2.95	2.67	<i>a</i>	2.60
Kentucky.....	0.83	2.06	2.14	1.58	1.85	1.37	2.06	2.33	1.82	2.15	1.87
Maryland.....	1.08	1.32	2.23	1.99	2.29	2.11	2.09	1.13	<i>a</i>	2.00	1.82
Michigan.....	64.88	6.11	3.26	4.24	2.54	2.58	2.93	2.83	2.43	1.94	2.91
Missouri.....	1.80	1.31	1.63	1.09	1.85	1.47	1.06	1.65	0.73	1.06	1.39
New Mexico <i>c</i>	7.98	7.44	4.81	10.11	7.26	7.61	2.35	3.82	10.13	9.26	7.27
Ohio.....	2.03	2.14	2.15	2.16	2.75	2.57	2.96	2.73	3.20	2.23	2.54
Oklahoma.....	6.24	7.59	8.35	9.62	5.42	3.63	5.76	4.81	4.15	3.02	5.35
Pennsylvania:											
Anthracite.....	3.28	2.86	3.47	2.03	3.41	3.69	3.83	3.35	4.19	3.89	3.43
Bituminous.....	2.82	2.43	2.56	3.37	2.65	3.44	2.90	2.76	4.40	3.15	3.11
Tennessee.....	2.60	1.15	6.10	25.80	2.69	2.81	2.38	3.07	2.79	3.06	4.97
Utah.....		138.96	5.81	3.24	3.21	4.06	5.14	3.69	3.07	2.99	13.82
Washington.....	13.60	7.79	5.59	7.83	5.13	6.69	2.73	2.52	6.04	4.68	5.94
West Virginia <i>c</i>	3.55	5.03	4.14	3.78	4.03	3.08	4.24	4.98	6.92	10.35	5.38
British Columbia.....	2.91	4.22	25.67	34.65	9.85	8.31	2.72	3.12	5.12	2.95	9.24
Nova Scotia.....	3.39	3.17	1.83	2.36	2.79	1.63	1.86	2.31	2.89	3.02	2.48
Average.....	2.98	3.25	3.24	3.49	3.14	3.37	3.44	3.16	4.17	3.96	3.46

a—Returns not available.

b—Six months only.

c—Year ended June 30, 1903.

Table No. 10—This table shows fatal accidents in the coal mines of North America in 1908, compared with the five previous years, also corresponding rates per 1,000 employed, with increases and decreases.

Fatal accidents in coal mines in North America in 1908, compared with the five previous years.

STATES, TERRITORIES AND PROVINCES	No. of Persons Killed Yearly Average		Rate Per 1,000 Employed		Rate of Increase or De- crease Per 1,000 Em- ployed
	1903-1907	1908	1903-1907	1908	
Alabama.....	115	110	6.19	5.86	-0.33
Colorado.....	75	61	6.48	4.25	-2.23
Illinois.....	167	175	2.84	3.59	+0.75
Indiana.....	44	45	2.60	2.36	-0.24
Iowa.....	30	38	1.83	2.20	+0.37
Kansas.....	a 33	d	a 2.97	d	-----
Kentucky.....	29	40	1.90	2.15	+0.25
Maryland.....	b 11	12	b 1.89	2.00	+0.11
Michigan.....	7	6	2.47	1.94	-0.53
Missouri.....	a 12	10	a 1.40	1.06	-0.34
New Mexico.....	15	34	6.49	9.26	+2.77
Ohio.....	129	112	2.85	2.23	-0.62
Oklahoma.....	36	44	4.71	3.02	-1.69
Pennsylvania:					
{ Anthracite.....	604	678	3.70	3.89	+0.19
{ Bituminous.....	540	572	3.26	3.15	-0.11
Tennessee.....	29	34	2.74	3.06	+0.32
Utah.....	8	8	3.70	2.99	-0.71
Washington.....	24	25	4.65	4.68	+0.03
West Virginia.....	223	625	4.73	10.35	+5.62
British Columbia.....	27	18	5.71	2.95	-2.76
Nova Scotia.....	27	39	2.30	3.02	+0.72
Total.....	2,180	2,686	3.47	3.96	+0.49

a 4 1-2 years only. b 4 years only. c Statistics for year ended June 30, 1908. d Not available

Table No. 11—This table shows a 20-year record of fatal accidents in the coal mines of North America from 1889 to 1908, inclusive; also, average accident rate for each 5-year period, and average accident rate as a whole per 1,000 employed:

Twenty-year record of fatal accidents in coal mines in North America, 1889-1908, inclusive.

YEAR	Number of Employees	Fatal Accidents	Accident Rate Per 1,000 Em- ployed	YEAR	Number of Employees	Fatal Accidents	Accident Rate Per 1,000 Employed
1889.....	282,223	660	2.52	1902.....	525,443	1834	3.49
1890.....	288,205	701	2.43	1903.....	574,210	1808	3.14
1891.....	325,840	1076	3.30	1904.....	598,856	2018	3.37
1892.....	342,744	859	2.51	1905.....	637,522	2191	3.44
1893.....	382,133	965	2.53	1906.....	658,189	2078	3.16
1894.....	385,579	957	2.48	1907.....	673,657	2813	4.17
1895.....	395,549	1057	2.67	1908.....	678,785	2686	3.96
1896.....	401,874	1120	2.79				
1897.....	405,433	847	2.34	1889-1893.....	1,601,145	4261	2.66
1898.....	405,600	1049	2.59	1894-1898.....	1,994,035	5130	2.57
1899.....	417,415	1247	2.98	1899-1903.....	2,473,743	7990	3.23
1900.....	462,308	1503	3.25	1904-1908.....	3,247,009	11,785	3.63
1901.....	494,367	1604	3.24	1889-1908.....	9,315,932	29,166	3.13

WAGE SCALES

The wage scales of the following mines are under the supervision of the United Mine Workers of America, and were furnished the department by Mr. J. S. McCracken, Secretary and Treasurer, with offices at Rooms 1 and 2, Plaza Block, Knoxville, Tenn:

Campbell County.

Falls Branch Coal Company.
Jellico Blue Gem Coal Company.
Wooldridge-Jellico Coal Company.

Hamilton County.

New Soddy Coal Company.

Scott County.

Glen Mary Coal & Coke Company.
Paint Rock Coal Mining Company.
Scott County Coal Company.
Stanley Coal Company.

The contract for the New Soddy Coal Company mines at Soddy was made Dec. 28, 1908, and expired Sept. 30, 1909. It was extended to Sept. 30, 1910, on Sept. 21, 1909, with the additional provision that the New Soddy Coal Company should handle the water in working places when in such quantities as to require bailing.

The contracts for Falls Branch Coal Company, Jellico Blue Gem Coal Company, Wooldridge-Jellico Coal Company, Glen Mary Coal & Coke Company, Paint Rock Coal Mining Company, Scott County Coal Company and Stanley Coal Company are extensions to August 31, 1910, of the contracts made September 3, 1907, for the year ended Sept. 3, 1908.

As to average wages paid miners and other employes in the coal mines of Tennessee during 1909 in all mines, special attention is directed to the table of statistics embraced in the report giving the average wages paid per day to each class of employes.

In addition to the *special* provisions herein given, the following uniform day wage scale and *general* provisions apply to all mines operated under the supervision of the United Mine Workers of America, except those of the New Soddy Coal Company in Hamilton County.

DAY LABOR.

Classification.	Rate per hour	Rate per day
Inside driver, one mule.....	21.42c	\$1.93
Drivers, two mules.....	23.10c	2.08
Drivers, three mules.....	24.25c	2.17
Drivers, four mules	25.30c	2.27
Head track layer	30.18c	2.71
Assistant track layer	21.42c	1.93
Trappers	7.61c	.68
Timberman	27.29c	2.44
Timberman helper	21.42c	1.93
Inside pumper and water bailer.....	21.42c	1.93
Motormen	27.40c	2.47
Motormen couplers (gathering)	23.31c	2.10
Motormen couplers (main haul).....	21.42c	1.93
Practical miners called to company work.....	27.40c	2.47
Machine runner	29.08c	2.63
Machine hostler (chain).....	26.25c	2.36
Machine hostler (punch).....	21.42c	1.93
Outside pumper and water bailer.....	20.05c	1.81
Muckers, or inside labor.....	20.05c	1.81
Coupler man, inside.....	18.90c	1.70

Classification.	Rate per hour	Rate per day
Coupler man, outside.....	15.04c	1.35
Coupler boy, inside.....	9.76c	.88
Coupler boy, outside.....	7.56c	.68
Tip house man	20.05c	1.81
Drum man	22.59c	2.04
Knuckle man	20.05c	1.81
Knuckle boy	15.04c	1.35
Furnace man (digging his own coal).....	22.59c	2.04
Furnace man and watchman.....	16.38c	1.47
Outside labor, including slate dumpers.....	15.04c	1.35
Blacksmith	26.35c	2 36
Pick sharpener	22.59c	2.04

Outside driver, 10c per day less than inside. Boy driver under 16 years of age, 35c per day less than regular prices.

IMPURITIES.

Any miner loading an unusual amount of dirt, slate, sulphur, or other impurities with his coal shall be laid-off one day for each offense. The company's representatives will, on all such occasions, show such unusual amount. Any miner laid off for three days during any one month shall then be subject to discharge; provided, however, that no dirt, slate, sulphur, or other impurities shall be included in the measurements to determine the height of coal.

TIMBERING.

Present conditions as to timbering shall continue at all times.

TRACKS.

In addition to the iron tracks now being used, the dip places where men have to push the cars shall be provided with iron rails.

CARS.

All cars are to be handled the same as last year, but it is understood that this clause shall not be construed to have miners handle cars where it has been customary for the company to handle them heretofore.

Rents, house fuel, pick sharpening at each mine shall remain without change during the life of this contract.

HOURS.

SECTION 1. Nine hours shall constitute a day's work for all classes of labor for which a scale of wages is made in this contract.

SEC. 2. A nine-hour day means nine hours' work in the mines at the usual working place for all classes of day labor and miners. This shall be exclusive of the time required in reaching the working place and departing from the same at night.

DRIVERS.

Drivers shall take their mules to and from the stable, and the time in so doing shall not include any part of the day's work.

It is distinctly understood that the time for starting each day depends on the arrival of railroad cars, providing the run begins in two hours from the regular starting time. Pay to begin with work, and work to stop at the regular quitting time.

PAY DAY.

Payment of wages shall be semi-monthly. The pay day being on or before the last day of each month, for the work performed during the first half of the month; and on or before the 15th of the succeeding month, for work performed during the last half of the month; but it is understood that statements shall be made only once for each month. The semi-monthly pay being the last in each month to be paid in even dollars.

An employee desiring to leave the employment of the company shall receive his money at once, or not later than five days after his notice is given.

CUT.

All employees whose wages are regulated by this scale shall be cut for dues and assessments, through the office, out of the first five days' work performed in each month, the same to be paid to the proper person or persons authorized to receive the same. The dues and assessments not to exceed \$1.00 per month, without the special written order of each employee. Initiation fees are hereby guaranteed to be uniform throughout District No. 19, and that the payment of same shall be prorated through sixty days if necessary.

TURN.

A square turn shall be kept all over the mine, in rooms and narrow work under ordinary conditions. Miners absenting themselves from their working places for three consecutive days without first obtaining the consent of the superintendent or bank boss, shall forfeit their working places, except in cases of sickness of themselves or any member of their family, and except also representatives of the organization engaged in work of the organization, in which case they must notify the superintendent or bank boss. Work shall not stop at any mine on any day other than on general holidays, and on April 1, without previous agreement with the management of such mine.

NOTE—See also special provisions applying to each operating company.

Special provisions applying to each operating company are as follows:

CAMPBELL COUNTY.

FALLS BRANCH COAL CO., JELICO BLUE GEM COAL CO.,
WOOLRIDGE-JELICO COAL CO.

(Special Provisions.)

MINING.

Resolved, That the price for mining shall be as follows:

That in the Jelico district pick-mined screen coal shall be paid for on the following basis, per ton of 2,000 pounds in weigh box.

No. 1. Under 2½ feet	\$1.01
No. 2. 2½ feet to 2 feet 9 inches .....	.943
No. 3. 2 feet 9 inches to 3½ feet	87.5
No. 4. 3 feet 6 inches and over .....	.807
Run of mine shall be, per ton of 2,000 pounds	56.44

YARDAGE.

The standard price of entries, either tight or gob, in the Jelico district shall be \$2.30 per yard in slate, but when both top and bottom are blasted, the price shall be \$2.90 per yard; solid rock entries, \$3.25; rock top and slate bottom, \$3.70. Entries, airways, and all narrow work in coal, when used for entries and airways, shall be

\$1.00 per yard. When the slate parting occurs in the coal, and neither top nor bottom is blasted, the price shall be \$1.40 per yard, in entries and airways, when the slate is loaded out and does not exceed 9 inches in thickness; over 9 inches and up to 18 inches in entries and rooms, 4 4-5c extra per ton shall be paid on coal.

ROOM TURNING.

In high coal, \$2.45; in medium coal, \$2.75; in low coal, \$3.05; for double rooms in all coal \$4.55.

NOTE—See also uniform day labor wage scale and general provisions.

SCOTT COUNTY.

GLEN MARY COAL & COKE COMPANY.

(Special Provisions.)

MINING.

1. Screened coal over 1¼-inch standard screen, per ton of 2,000 pounds:

27 inches and under.....	\$1.05
Over 27, to 30 inches.....	99.75c
30 to 33 inches.....	94.50c
33 inches and over.....	92c

2. Excess on band coal seam will be paid for as follows:

Band up to 9 inches thick, 2 cents per ton extra.

Band 9 inches to 18 inches, 5 cents per ton extra.

Band over 18 inches to be paid for at price agreed on by the bank committee and superintendent; if they do not agree, it is to be settled as per clause for all such differences.

3. Entries and airways shall be \$1.02 to \$1.16 per yard based on above coal and band basis.

4. Water yardage, 25 cents per yard.

5. Brushing top in rooms 53¾ cents per yard, and it must be taken 12 inches in all places.

6. Slate shooting, \$1.34 to \$1.88 per yard, owing to character of material and thickness to be shot, otherwise a subject for special contract and conditions differing so much makes it difficult to make a regular basis to cover all cases.

7. Room turning, \$3.45, \$4.03 and \$4.57, for room necks and widening same for room, based on coal basis and band extras.

8. Measurements of mining work shall be as heretofore, twice a month, last of each half month.

In addition to the regular uniform wage schedule, dinkey engineers are to receive 30.094c per hour or \$2.71 per day, and oilers are to get 12.50c per hour or \$1.12 per day.

NOTE—See also uniform day labor wage scale and general provisions.

SCOTT COUNTY.

PAINT ROCK COAL MINING COMPANY.

(Special Provisions.)

MINING.

All coal under 24 inches shall be 78.75c per ton for mining. All coal from 24 to 27 inches in thickness, 73.50c per ton. All coal from 27 to 30 inches in thickness, 68.25c per ton. All coal from 30 inches up in thickness, 63c per ton.

It is understood that the mining of coal under 22 inches shall not be required

under this contract, and should it be desired to work any coal of that thickness at any time, it shall be made a matter of special agreement.

This contract shall apply to all mines which may be operated by the said first party, at or near Almy, Tenn., except No. 1 mines, which shall be paid as follows:

All coal under 30 inches in thickness shall be 78.75c per ton. All coal 30 inches and over shall be governed by above scale for coal at other mines under this contract.

It is further agreed and understood that all coal mined under this contract shall be paid on run of mine basis.

The prices for day labor shall remain the same that were paid last year.

Narrow work, driving entries and airways, shall be paid for as follows:

All entries shall be \$2.55 per yard where the coal is over 24 inches. Under 24 inches, \$3.00 per yard, except wet entries. All airways shall be \$1.10 per yard, unless they are wet.

All entries and airways having wet holes that water will run out of, if bored horizontally, when drilled in proper place, necessitating the use of cartridges, or where water stands against the face, so as to require bailing, shall be determined wet, and 25c additional shall be paid per yard for same.

Room turning shall be as follows:

Coal under 30 inches shall be.....	\$3 05
Coal from 30 to 33 inches.....	2 75
Coal above 33 inches	2 45

All wet rooms and necks shall be paid 5 cents per ton extra on the coal.

All yardage for room brushing shall be 60 cents per yard, and shall, in all cases, be brushed 12 inches high. Where draw slate occurs the full width of the room or air course, the miner shall be paid 1 cent per ton extra on his coal for every inch in thickness, or slate he has to contend with, with average thickness, to 10 inches, except where the combined thickness of coal and draw slate reaches a height of three and one-half feet, in which case the miner shall be paid 60 cents per yard for brushing, the same as if actually done, to compensate him for handling the draw slate. In case of draw slate covering only a portion of the room or air course, the miner shall be paid in proportion to the space covered.

Any man having to lay away from his work for timbers, tracking, or anything caused by the company's neglect, for three or more consecutive days, shall be paid \$2.08 per day for his time.

When slate is taken from the mines by a night shift, the miner shall lay his own jumpers or short rails, but the mine foreman shall have material for laying such track at hand for use.

House rent and coal furnished employees shall remain the same as last year.

The same bank rules which governed this place last year shall be renewed, with any additional rules which may become necessary.

NOTE—See also uniform day labor wage scale and general provision.

SCOTT COUNTY.

SCOTT COUNTY COAL & COKE COMPANY.

(Special Provisions.)

MINING.

Mine run coal, strictly clean of all impurities, per ton of 2,000 pounds.

Under 24 inches, per ton.....	84c
24 to 27 inches, per ton.....	78.75c

27 to 30 inches, per ton.....	73.50c
30 to 33 inches, per ton.....	68.25c
33 to 36 inches, per ton.....	.63c
36 inches and over, per ton.....	57.75c
2 cents per ton over above prices when dirt band is over 10 inches.	

When rooms are driven over 100 feet, 5 cents per ton extra, and over 160 feet, 7½ cents per ton extra.

ENTRIES.

Rock top and slate bottom, per yard.....	\$3 70
Rock (with hammer and steel), per yard.....	3 25
Stratified rock top, per yard.....	2 70
Slate, per yard	2 30
Airways, per yard	1 00
Room turning, per room	2 75
Brushing, per yard (per foot).....	60

NOTE—See also uniform day labor wage scale and general provisions.

SCOTT COUNTY.

STANLEY COAL COMPANY,

(Special Provisions.)

MINING.

All coal under 24 inches shall be 78.75c per ton for mining. All coal from 24 to 27 inches in thickness, 73.50c per ton. All coal from 27 to 30 inches in thickness, 68.25c per ton. All coal from 30 inches up in thickness, 63c per ton.

It is understood that the mining of coal under 22 inches shall not be required under this contract, and should it be desired to work any coal of that thickness at any time, it shall be made a matter of special agreement.

This contract shall apply to all mines, which may be operated by the said first party, at or near Almy, Tenn., except No. 1 mines, which shall be paid as follows:

All coal under 30 inches in thickness shall be 78.75c per ton. All coal 30 inches and over shall be governed by above scale for coal at other mines, under this contract.

It is further agreed and understood that all coal mined under this contract shall be paid on run of mine basis.

The prices for day labor shall remain the same that were paid last year at these mines.

Narrow work, driving entries and airways, shall be paid for as follows:

All entries shall be \$2.55 per yard where the coal is over 24 inches. Under 24 inches, \$3.00 per yard, except wet entries. All airways shall be \$1.10 per yard, unless they are wet.

All entries and airways having wet holes that water will run out of, if bored horizontally, when drilled in proper place, necessitating the use of cartridges, or where water stands against the face, so as to require bailing, shall be determined wet, and 25 cents additional shall be paid per yard for same.

Room turning shall be as follows:

Coal under 30 inches shall be.....	\$3 05
Coal from 30 to 33 inches.....	2 75
Coal above 33 inches.....	2 45

All wet rooms and necks shall be paid 5 cents per ton extra on the coal.

All yardage for room brushing shall be 60 cents per yard, and shall, in all cases, be brushed 12 inches high. Where draw slate occurs the full width of the room or air course, the miner shall be paid 1 cent per ton extra on his coal for every inch in thickness, or slate he has to contend with, with average thickness, to 10 in., except where the combined thickness of coal and draw slate reaches a height of three and one-half feet, in which case the miner shall be paid 60 cents per yard for brushing, the same as if actually done, to compensate him for handling the draw slate. In case of draw slate covering only a portion of the room or aircourse, the miner shall be paid in proportion to the space covered.

Any man having to lay away from his work for timbers, tracking or anything caused by the company's neglect, for three or more consecutive days, shall be paid \$2.08 per day for his time.

When slate is taken from the mines by a night shift, the miner shall lay his own jumpers or short rails, but the mine foreman shall have material for laying such track at hand for use.

It is understood that the house rent and coal furnished employes shall remain the same as last year.

The same bank rules which governed this place last year shall be renewed, with any additional rules which may become necessary.

NOTE—See also uniform day labor wage scale and general provisions.

HAMILTON COUNTY.

NEW SODDY COAL CO (Entire contract and rules.)

The New Soddy Coal Company and the miners and other employes of said company, through their Executive Committee appointed by them to act for them, and the officials of the United Mine Workers of America, hereby adopt as the agreements for the ensuing nine months, ending September 30, 1909, the following, viz.:

First—Nine hours shall constitute a day's work for all classes of labor, for which a scale of wages is made in this contract. A nine hour day means nine hours' work in the mines, at usual working place, for all classes of day labor and miners. This shall be exclusive of the time required in reaching the working place and departing from the same at night. The drivers shall take their mules to and from the stable, and the time in so doing shall not be included in any part of the day's work. An accommodation trip will be run in No. 1 mine, starting at 6:30 a. m. Firing time for less than a full day to be 30 minutes after run stops. For a full day firing time will be 4 p. m.

Second—Two thousand pounds shall constitute a ton. Prices for mining shall be as follows, viz.:

Coal 36 inches and over.....	45c per ton
Coal 30 to 36 inches.....	51c per ton
Coal 24 to 30 inches.....	55c per ton
Coal 18 to 24 inches.....	65c per ton
Pillar coal	51c per ton

Third—Yardage prices shall be as follows, viz.: The standard price of entry, either tight or gob, will be \$1.85 per yard for 5 feet high and 8 feet width of roadway; \$2.55 per yard for 5 feet 6 inches high and 8 feet of roadway. When the coal is under 24 inches in thickness, \$4.05 per yard; airways, 50c per yard. Billie rib yardage, 72c in coal only; cut throughs, 45c per yard; but when more than 18 feet of solid coal is cut, special price. When rooms are turned 9 feet wide and 16 feet in depth of neck, \$3.25 per room; wet places to be paid 2c per ton extra. Only such places shall be termed wet in which the water will run from drill holes when

bored horizontally and in proper place, or when water stands at face so as to require bailing. Cut throughs to be measured from one road prop to far side of coal.

WAGE SCALE.

Classification.	Per hour.	Per day.
Driving single mule	21.4c	\$ 1.93
Driving two mules	23.1c	2.08
Driving three mules	24.3c	2.17
Driving four mules	25.3c	2.27
Boss track layer	30.2c	2.71
Assistant track layer	21.4c	1.93
Trappers	7.6c	.68
Sheavemen, inside	21. c	1.89
Sheavemen, outside	18.9c	1.70
Rope rider, inside	25.6c	2.30
Rope rider, outside	15.7c	1.42
Inside labor, on rock	18.3c	1.65
Engineers (per month).....		51.45
Firemen	17.4c	1.57
Outside labor	13.6c	1.23
Inclinemen	15.7c	1.42
Dumpers	15.1c	1.36
Tipplemen	18.1c	1.63
Blacksmith	26.2c	2.36
Pick sharpeners	22.5c	2.03
Blacksmith helpers	16.3c	1.47
Washerman	20.3c	1.83
Fireman at washer	18.9c	1.70
Labor on coke yard	14. c	1.26
Charging coke ovens	3.5c per oven.	
Pulling ovens	33c, 37c, 39c per oven	
Night watchman		1.57
Outside driver, 10c per day less than inside. Boy driver under 16 years of age, 35c per day less than regular rates.		

Fourth—Any miner called upon to do company work shall be paid at the rate of 24.4-10c per hour, or \$2.20 per day.

Fifth—Pay-day shall be on the second Saturday of each month for work done last half, and on last Saturday for work done on the first half of the month. Men absenting themselves from work on the first day of any month, or on the Monday succeeding pay-day, will be discharged.

Sixth—Blacksmithing will be 35c per month per turn. This is to cover the sharpening and dressing of tools only.

Seventh—Cut—all employes whose wages are regulated by this scale shall be cut for dues and assessments through the office out of the first five days' work performed in each month, the same to be paid to the proper person or persons authorized to receive the same; the dues and assessments not to exceed \$1.00 per month without special written order of each employe. Initiation fees are hereby guaranteed to be uniform throughout District No. 19, and that the payment of same shall be prorated through sixty days, if necessary.

Eighth—House coal to be as follows: Lump coal, \$2.50 per ton; nut coal, \$1.50 per ton, and run of mine coal \$1.00 per ton, in town limits.

Ninth—No committee shall visit any man at his working place except when accompanied by the mine foreman, and then only to settle a grievance.

Tenth—It is fully understood and agreed by the parties to this agreement that all employes of this company are required to work six days per week, when called on to do so, excepting legal holidays, half days on pay-days, and April 1. Any employe desiring to be idle for a day must secure permission of his foreman in advance, unless prevented by sickness or other unavoidable cause. Any employe being idle without notifying his foreman shall, for the first offense, be suspended from work three days; for the second offense be suspended for five days; and any one being idle more than three days in any one month may be suspended for one month, or discharged.

Eleventh—If any differences arise between the operator and the miner, or between the operator and any of the employes of the mine, settlement shall be arrived at without stopping work. If the parties immediately affected can not reach an agreement between themselves, the question shall be referred without delay to the local committee and the company's officials. If they fail to affect a settlement, it shall be referred to the officials of District No. 19, United Mine Workers of America, and the officials of the company. If they fail to adjust the grievance, it shall be referred to a Board of Arbitration, composed of one or two persons from each side, with power to select an umpire. Their decision shall be final and binding on all parties to this agreement and those they represent. Arbitrators shall be appointed within three days after the case is submitted to their arbitration, and they shall proceed within five days to hear and determine the case. In the event the arbitrators be unable to select an umpire within fifteen days after their appointment, Judge M. M. Allison is to select an umpire from three names submitted by each respective side.

The operator and his superintendent and mine manager shall be respected in the management of the mine and in direction of the working force. All day men shall perform whatever kind of day labor the management may direct them to perform from time to time. The right to hire includes the right to discharge, and it is not the purpose of this agreement to abridge the right of the employer in either of these respects. If, however, any employe shall be suspended or discharged by the company, and it is claimed that an injustice has been done him, an investigation shall be conducted as herein provided, and if it is determined that an injustice has been done, the operator agrees to reinstate said employe.

On September 21, 1909, this contract was extended to September 30, 1910, with an additional provision requiring the New Soddy Coal Co. to handle the water in working places when in such quantity as to require bailing.

Witness our hands this the 18th day of December, 1908.

NEW SODDY COAL COMPANY,

J. H. JONES, *Engineer in Charge.*

D. A. Bell, Lige Eustice, T. M. Gann, Phil Lynch, George Branham, Pat Cary, Vice President of District No. 19, and T. J. Smith, N. B. M., U. M. W. of A.—Scale Committee.

MINING RULES.

The following mining rules were adopted by and between the New Soddy Coal Company and officials of the U. M. W. of A.:

1. Starting time, 7 a. m. Quitting time, 4 p. m. Any violation of this rule, suspension of turn for one day; second violation, suspension for three days; third violation, discharged.

2. Miners and mine laborers will be taken in and out of the mine by an accommodation trip. When mines work full day, the accommodation trip will leave Clayton side

track at 4:15 p. m. When mines work less than a full day, the trip will leave 45 minutes after the suspension of work. Men riding this trip will be at their own risk.

3. Blacksmiths shall have all tools sharpened by 6:30 a. m. that are delivered at the shop the day before.

4. When slate falls on the roadway it shall be removed without delay; and if delay be made, the miner shall be permitted to remove the same, being paid at the rate of \$2.20 per day.

5. A square turn shall be kept in all mines.

6. That there shall be an allowance of three cars per turn in preparing roadway. No miner shall prepare his room for roadway without permission of the Mine Foreman, unless the face is fifteen (15) feet in advance of the roadway, in which case he must notify the Mine Foreman by registering same at the Mines Depot. After said notice has been given, the roadway must be prepared within the period of two (2) days, unless prevented from so doing by some unforeseen occurrence. In case of failure to take such top or bottom, the miner to be given employment by the company and paid at the rate of \$2.20 per day until said roadway has been completed.

7. Equal rights to all and special privileges to none.

8. That no man be compelled to work double in rooms.

9. Any company man competent to mine coal, and applying for the same, shall have preference in employing miners.

10. The company shall help handle cars in rooms to rise where they can not be handled by the miner.

11. In case of death of an employe or member of his family, the following rule will prevail:

Death by accident in or around the mine, the mines shall remain idle until after the funeral; death from natural causes of an employe or member of his family, the work shall not be idle, but any desiring to attend the funeral may do so, but not otherwise.

12. Docks for slate: For the first eight (8) pounds, dock will be fifty (50) pounds; for each additional two (2) pounds, an additional fifty (50) pounds. When docks equal 2,000 pounds in any one day the miner will be discharged.

13. All wrecked cars and cars for boilers to be given average weight, same to be decided by company and Check Weighman.

14. No miner shall be allowed in the mines on idle days, unless engaged in company or special work. In case of the mines being idle by reason of insufficiency of men reporting for work, those miners reporting for work on such days are permitted to work.

15. The company shall at all times keep within reasonable distance all necessary timber, miners to place on road, properly marked with number and entry, the boss driver to see that they are promptly delivered the same day to party marked for.

16. Employes will be discharged for the following reasons: (1) Disorderly conduct or drunkenness. (2) Gambling or shooting on company property. (3) Taking coal, timber or tools without permission, or changing tickets on cars. (4) Firing before stipulated time without permission of the mine foreman. (5) Committing a nuisance in entries, airways or rooms necks. (6) Riding on loaded trips without permission of the mine foreman. (7) Leaving air or trap door open.

17. No laborer, who is not on company work, will be allowed any turn, except entrymen and sons of employes and dependent widows' sons, they to be allowed one-half turn under 16 years of age, and full turn over 16 years of age.

18. No room shall be turned off another room, except to secure coal that can not be reached by an entry or air course.

19. Any party or parties intentionally violating the foregoing rules will be discharged.

COAL MINES IN TENNESSEE

Section 9 of the Mining Code of Tennessee provides that "The maximum period that shall occur between inspections and examinations of each mine in this State, and the minimum quantity of fresh air that shall be supplied to each person and each animal employed in the mines of this State shall be governed by the following classification of mines, based upon the existing conditions heretofore, at present, or may appear in the future, in accordance with the conditions jeopardizing human life and health in such mines. The classification shall be as follows:

Class A shall include every coal mine or other mine known to liberate fire damp (CH_4) at present or in the future, and all mines of this class shall be inspected by the chief inspector, or the district inspector, at least once every sixty (60) days; and the minimum amount of fresh air supplied to each person and animal employed in the mine, by the ventilating currents, shall be one hundred and fifty (150) cubic feet per minute for each person, and six hundred (600) cubic feet per minute for each animal employed in the mine at one time. At any time fire damp is discovered in the mine or mines of other classes the inspector may place such mine or mines in this class, and then it shall be subject to the restrictions herein prescribed for the operation of mines of such class. However, if the amount of fire damp is slight or limited, and the safety of employes is not endangered from such gas, the chief inspector may use his best judgment in changing the classification of such mine or mines; and any mine liberating sufficient fire damp to be detected on the flame of a modern test lamp, may, by action of the chief mine inspector, be placed in this class; and if changes are necessary in order that they may comply with this act, the chief inspector shall allot them a reasonable time to make such changes; and if he deems it necessary, he may remove a portion of or all the inside employes until such changes are made in accordance with the provisions of this Act. The minimum amount of fresh air required and specified may be increased by the chief inspector should he deem it necessary for the better protection of human life and health, as the conditions may require.

Class B shall include every coal or other mine that is dry and dusty to such an extent as, in the best judgment of the chief inspector, renders the same dangerous from dust explosions; and where coal or other dust is deposited on timbers, sides and bottoms of the airways, entries or other workings of the mine, and where danger would be increased by too great a velocity of the ventilating currents in mines of this class, the minimum amount of fresh air supplied by ventilating currents shall not be less than one hundred (100) cubic feet per minute for each person, and five hundred (500) cubic feet per minute for each animal employed in the mine at one time; and the chief inspector or a district inspector shall inspect and examine each mine of this class at least once every sixty (60) days, or oftener, and determine if the mine is operated under the restrictions of this Act and those governing mines of this class. The chief mine inspector shall have the right to classify the mines and determine to what class they shall belong.

Class C shall include every coal or other mine employing over twenty (20) persons and three (3) mules that is not at present or may in the future liberate sufficient fire damp to be detected on the flame of a modern test lamp, and has

not been classed as a dry and dusty mine by the chief inspector of mines. The minimum quantity of fresh air that shall be supplied to each person employed in the mine by the ventilating currents shall be eighty-five (85) cubic feet per minute, and for each animal employed in the mine it shall be five hundred (500) cubic feet per minute; and it shall be the duty of the chief mine inspector or a district inspector to inspect and examine each mine of this class at least once every ninety (90) days; and at any time conditions may require, the chief inspector may increase the quantity of fresh air to be supplied by ventilating currents, and when conditions may require, may change mines from one class to another by proper notice to all parties interested.

Class D shall include all coal or other mines working less than twenty (20) persons in which fire damp has not been discovered at any time, and which are not considered to be dry and dusty mines. This class of mines shall supply the same amount of fresh air by ventilating currents to persons working in same as required for Class C mines. Mines of this class shall be inspected every ninety (90) days by the chief inspector or a district inspector. The chief inspector shall have the authority to change the classification of mines of this class as the conditions may require to maintain them in proper classes.

Class E shall include all copper, iron ore, phosphate, lead or other minerals being mined by shaft, slope, drift or otherwise; and mines of this class shall be examined once every three (3) months by the chief mine inspector or a district inspector, and the amount of fresh air supplied by the ventilating currents for each person and animal employed shall be governed by the conditions therein, and in no case shall the quantity of the ventilating currents be increased over that of "Class A" mines; provided, however, that whenever any explosive gases are met with, the chief inspector shall fix the required amount of ventilating current per person.

SPECIAL RULES.

Under and by virtue of the provisions of the Mining Laws, the Chief Mine Inspector, and the District Mine Inspectors, are required to formulate special rules in conjunction with the Superintendent and Mine Foreman, for the regulation and operation of dry and dusty or gaseous mines.

Under this provision of the Mining Law, the following mines are operated under special rules: Black Diamond, 1 and 5; Buck Mountain, Campbell, 2 and 3; Cross Mountain, 1 and 3, and Thistle, 1, in Anderson County. Atpontley, 2, 4 and 6, in Bledsoe County; Bear Wallow, Big Block, Blue Gem, Cambria, Davis Creek, Falls Branch, Italian B. G., Italy, Kimberley, Powhattan, Rex 1 and 2, Rich Mountain, Westbourne, and Zechini, in Campbell County. King Mountain and Pruden in Claiborne County. Brushy Ridge and Flat Branch in Grundy County. Soddy, 1, 2 and 5, in Hamilton County. Battle Creek in Marion County. Eagle and Prudential in Morgan County; Brier Hill 1 and 2 in Overton County. Old in Roane County. Glen Mary and Paint Rock, 1, in Scott County. Bon Air, 6, in White County.

COAL MINING MACHINES.

In addition to the detail data given as to the various coal mines in Tennessee, the following mines use under-cutting coal mining machines: Campbell, Cross Mountain 1, Tennessee and Wind Rock in Anderson County; Anchor, Block, Jackson, Elk Valley, Gem, Indian Mountain, Red Ash, Remy, Rex 2, Rich Mountain, and Westbourne in Campbell County; Buffalo, Fork Ridge, Mingo 5, and Sterling in Claiborne County; Battle Creek in Marion County, Big Brushy, Bowling, and Little Brushy in Morgan County; Bon Air Shaft, Bon Air 6, and Raven's Croft in White County.

DETAIL COAL MINE DATA

The following chapter gives the description and detailed data pertaining to the various coal mines in Tennessee, as of December 31, 1909, arranged alphabetically by counties and by mines, and limited to class and location of mines, seam worked, character of roof and bottom of seam, system of development, ventilation and haulage.

ANDERSON COUNTY.

Black Diamond No. 1 Mine—Owner, Coal Creek Mining & Mfg. Co., Knoxville; Operator, Black Diamond Coal Co., Knoxville; President, J. W. Borches, Knoxville; Secretary, W. F. Searle, Knoxville; Inside Foreman, W. E. Hendren, Coal Creek; Gas Boss, Henry Hill, Coal Creek.

This is a Class A drift mine, located 1,029 feet above sea level, in Cumberland Mountain, 3 miles from Coal Creek, and connects with Southern Railroad. The Coal Creek seam, having an average thickness of 44 inches, is worked. The roof is slate and the bottom fire clay and sandstone. It is developed on the double entry, room and pillar system. Ventilation is produced by fan with a diameter of 20 feet, and is distributed as continuous current. Haulage is conducted from rooms to rope siding a distance of 8,000 feet, by electricity, and from rope siding to tippie, a distance of 4,700 feet, by tail rope.

ANDERSON COUNTY.

Black Diamond No. 5 Mine—Owner, Coal Creek Mining & Mfg. Co., Knoxville; Operator, Black Diamond Coal Co., Knoxville; President, J. W. Borches, Knoxville; Secretary, Wm. F. Searle, Knoxville; Inside Foreman, John Sharp, Coal Creek; Gas Boss, James Andrews, Coal Creek.

This is a Class A drift mine, located 1,029 feet above sea level, in Cumberland Mountain, 3 miles from Coal Creek, and connects with Southern Railroad. The Coal Creek seam, having an average thickness of 44 inches, is worked. The roof is slate and the bottom fire clay and sandstone. It is developed on the double entry, room and pillar system. Ventilation is produced by fan with a diameter of 10 feet, and is distributed by the split system. Haulage is conducted from rooms to side track, a distance of 1,400 feet, by mules, and from side track to tippie, a distance of 3,800 feet, by tail rope.

ANDERSON COUNTY.

Black Diamond No. 6 Mine—Owner and Operator, Black Diamond Coal Co., Knoxville; President, J. W. Borches, Knoxville; Secretary, Wm. F. Searle, Knoxville; Inside Foreman, John Jeffreys, Sr., Briceville; Gas Boss, John Jeffreys, Sr., Briceville.

This is a Class B drift mine, located 1,000 feet above sea level, in Cumberland Mountain, $3\frac{1}{2}$ miles from Coal Creek, and connects with Southern Railroad. The Coal Creek seam, having an average thickness of 48 inches, is worked. The roof is fire clay and the bottom slate. It is developed on the room and pillar system. Ventilation is produced naturally and by furnace with a grate area of 40 feet; work consists in removing outcrop coal in old Shamrock No. 1 mine. Haulage is conducted from rooms to outside tram, a distance of 400 feet, by mules, and from outside tram to tippie, a distance of 3,085 feet, by mules.

ANDERSON COUNTY.

Brookside Mine—Owner, Coal Creek Mining & Mfg. Co., Knoxville; Operator, Royal Coal & Coke Co., Knoxville; President, H. S. Pless, Knoxville; Secretary, E. G. Oats, Knoxville; Inside Foreman, J. M. Stonecipher, Pless; Gas Boss, J. P. Weese, Pless.

This is a Class B drift mine, located 1,000 feet above sea level, in Cumberland Mountain, $\frac{1}{4}$ mile from Pless, and connects with Southern Railroad. The Coal Creek seam, having an average thickness of 48 inches, is worked. The roof and bottom are both slate. It is developed on the single entry, room and pillar system. Ventilation is produced by fan with a diameter of 14 feet, and is distributed by the split system. Haulage is conducted from room to double parting, a distance of 400 feet, by mules; from parting to mine entrance, a distance of 1,200 feet, by rope; and from mine entrance to chute, a distance of 450 feet, by mule.

ANDERSON COUNTY.

Buck Mt. Mine—Owner, Coal Creek Mining & Mfg. Co., Knoxville; Operator,

Royal Coal & Coke Co., Knoxville; *President*, H. S. Pless, Knoxville; *Secretary*, E. G. Oats, Knoxville; *Inside Foreman*, J. M. Stonecipher, Pless; *Gas Boss*, J. P. Weese, Pless.

This is a Class A slope mine, located 1,000 feet above sea level, in Cumberland Mountain, $1\frac{1}{4}$ miles from Pless, and connects with Southern Railroad. The Coal Creek seam, having an average thickness of 48 inches, is worked. The roof and bottom are both slate. It is developed on the double entry, room and pillar system. Ventilation is produced by fan with a diameter of 10 feet, and is distributed by the split system. Haulage is conducted from rooms to double parting, a distance of 1,000 feet, by mules; from parting to mine entrance, a distance of 2,000 feet, by tail rope, and from mine entrance to chute, a distance of 450 feet, by mules.

ANDERSON COUNTY.

Campbell No. 2 Mine—*Owner and Operator*, Campbell Coal Mining Co., Oliver Springs; *President*, R. O. Campbell, Atlanta, Ga.; *Secretary*, J. B. Campbell, Atlanta, Ga.; *Inside Foreman*, Edward Renwick, Oliver Springs.

This is a Class A drift mine, located 1,100 feet above sea level, in Cumberland Mountain, 3 miles from Oliver Springs, and connects with L. & N. Railroad. The Coal Creek seam, having an average thickness of 42 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the single entry system. Ventilation is produced by furnace with a grate area of 48 feet, and is distributed by the split system. Haulage is conducted from inside to mine entrance, a distance of 3,000 feet, by rope; from mine entrance to chute, a distance of 1,000 feet, by mules; and from chute to railroad, a distance of 90 feet, by gravity.

ANDERSON COUNTY.

Campbell No. 3 Mine—*Owner and Operator*, Campbell Coal Mining Co., Oliver Springs; *President*, R. O. Campbell, Atlanta, Ga.; *Secretary*, J. B. Campbell, Atlanta, Ga.; *Inside Foreman*, Edward Renwick, Oliver Springs.

This is a Class B mine, located 1,100 feet above sea level, in Cumberland Mountain, 2 miles from Oliver Springs, and connects with L. & N. Railroad. The Coal Creek seam, having an average thickness of 42 inches, is worked. The roof is slate and sandrock, and the bottom fire clay. It is developed on the single entry system. Ventilation is produced by furnace with a grate area of 42 feet, and is distributed as continuous current. Haulage is conducted from inside to knuckle, a distance of 1,500 feet, by mules; and from knuckle to railroad, a distance of 700 feet, by gravity.

ANDERSON COUNTY.

Campbell No. 4 Mine—*Owner and Operator*, Campbell Coal Mining Co., Oliver Springs; *President*, R. O. Campbell, Atlanta, Ga.; *Secretary*, J. B. Campbell, Atlanta, Ga.; *Inside Foreman*, Edward Renwick, Oliver Springs.

This is a Class B drift mine, located 1,100 feet above sea level, in Cumberland Mountain, $3\frac{1}{2}$ miles from Oliver Springs, and connects with L. & N. Railroad. The Coal Creek seam, having an average thickness of 42 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the single entry system. Ventilation is produced by furnace with a grate area of 56 feet, and is distributed as continuous current. Haulage is conducted from inside to mine entrance, a distance of 300 feet, by mules; from mine entrance to knuckle, a distance of 2,400 feet, by mules; and from knuckle to railroad, a distance of 300 feet, by gravity.

ANDERSON COUNTY.

Cross Mt. No. 1 Mine—*Owner* Coal Creek Mining & Mfg. Co., Knoxville; *Operator*, Knoxville Iron Co., Knoxville; *President*, Wm. P. Chamberlain, Knoxville; *Secretary*, O. A. Brown, Knoxville; *Inside Foreman*, Geo. Bulmer, Briceville; *Gas Boss*, J. F. Hatmaker, Briceville.

This is a Class B drift mine, located 1,006 feet above sea level, in Cumberland Mountain, 4 miles from Coal Creek, and connects with Southern Railroad. The Coal Creek seam, having an average thickness of 46 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the entry and airway, double rooms and pillar system. Ventilation is produced by an electric fan of 300 revolutions and a diameter of 7 feet, and is distributed by the split system. Haulage is conducted from rooms to sidetrack, a distance of 2,000 feet, by mules; from sidetrack to outside, a distance of 6,600 feet, by electric motors; and from outside to railroad, a distance of 300 feet, by motors.

ANDERSON COUNTY.

Cross Mt. No. 3 Mine—*Owner*, Coal Creek Mining & Mfg. Co., Knoxville; *Operator*, Knoxville Iron Co., Knoxville; *President*, Wm. P. Chamberlain, Knoxville; *Secretary*, O. A. Brown, Knoxville; *Inside Foreman*, W. A. Farmer, Briceville.

This is a Class C drift mine, located 1,006 feet above sea level, in Cumberland Mountain, 4 miles from Coal Creek, and connects with Southern Railroad. The Coal Creek seam, having an average thickness of 48 inches, is worked. The roof is slate and fire clay and the bottom fire clay. It is developed on the entry and airway, single room and pillar system. Ventilation is produced by furnace with a grate area of 60 feet, and is distributed by the split system. Haulage is conducted from sidetrack to mine entrance, a distance of 1,000 feet, by mules; and from mine entrance to chute, a distance of 1,000 feet, by mules.

ANDERSON COUNTY.

Eureka No. 2 Mine—*Owner*, Coal Creek Mining & Mfg. Co., Knoxville; *Operator*, Royal Coal & Coke Co., Knoxville; *President*, H. S. Pless, Knoxville; *Secretary*, E. G. Oates, Knoxville.

This is a Class A drift mine, located 998 feet above sea level, in Cumberland Mountain, $\frac{1}{4}$ mile from Pless, and connects with Southern Railroad. The Coal Creek seam, having an average thickness of 42 inches, is worked. The roof and bottom are both slate. It is developed on the double entry and double room and pillar system. Ventilation is produced by fan with a diameter of 16 feet, and is distributed by the split system. Haulage is conducted from rooms to sidetrack, a distance of 600 feet, by mules; from sidetrack to general sidetrack, a distance of 1,500 feet, by ropes; and from general sidetrack to tippie, a distance of 650 feet, by mules.

ANDERSON COUNTY.

Fraterville No. 1 Mine—*Owner*, Coal Creek Mining & Mfg. Co., Knoxville; *Operator*, Coal Creek Coal Co., Knoxville; *President*, E. C. Camp, Knoxville; *Secretary*, H. M. Camp, Knoxville; *Inside Foreman*, B. F. Loving, Coal Creek; *Gas Boss*, C. M. Craig, Coal Creek.

This is a Class B drift mine, located 985 feet above sea level, in Cumberland Mountain, 2 miles from Coal Creek, and connects with Southern Railroad. The Coal Creek seam, having an average thickness of 42 inches, is worked. The roof is slate and the bottom slate and fire clay. It is developed on the single entry system. Ventilation is produced by fan with a diameter of 16 feet, and is distributed by the airway and split system. Haulage is conducted from rooms to sidetrack, a distance of 4,000 feet, by mules; and from sidetrack to tippie, a distance of 7,000 feet, by tail rope.

ANDERSON COUNTY.

Middle Ridge Mine—*Owner and Operator*, Tennessee Coal Co., Knoxville; *President*, Geo. P. Chandler, Knoxville; *Secretary*, Hugh L. McClung, Knoxville; *Inside Foreman*, Charles Probert, Briceville.

This is a Class C drift mine, located 975 feet above sea level, in Cumberland Mountain, 4 miles from Coal Creek, and connects with Southern Railroad. The Coal Creek seam, having an average thickness of 48 inches, is worked. The roof is slate and clay and the bottom slate. It is developed on the entry and airway system. Ventilation is produced by natural conditions. Haulage is conducted from rooms to drum, a distance of 1,500 feet, by mules; and from drum to railroad, a distance of 716 feet, by incline rope.

ANDERSON COUNTY.

Reed Mine—*Owner*, E. A. Reed, Oliver Springs; *Operator*, Oliver Springs Coal & Clay Co., Oliver Springs; *President*, B. F. Ryan, Oliver Springs.

This is a Class C drift mine, located 950 feet above sea level, in Cumberland Mountain, 1 mile from Oliver Springs, and connects with L. & N. and Southern Railroads. The Coal Creek seam, having an average thickness of 30 inches, is worked. The roof is sandstone and the bottom fire clay. This operation is a reorganization of the old Big 3 Mine, and when put into service, rope or electric haulage will be inaugurated. The main entry is now in 900 feet.

ANDERSON COUNTY.

Riding Mine—*Owner and Operator*, D. J. Riding, Briceville; *President*, D. J. Riding, Briceville; *Inside Foreman*, D. J. Riding, Briceville.

This is a Class C drift mine, located 980 feet above sea level, in Cumberland Mountain, $\frac{1}{2}$ mile from Briceville, and connects with Southern Railroad. The Coal Creek seam, having an average thickness of 48 inches, is worked. The roof and bottom are both fire clay. It is developed on the single entry, room and pillar system. Ventilation is produced by natural conditions. Haulage is conducted from cross entry to main entry, a distance of 200 feet, by mules; from main entry to tippie and incline, a distance of 200 feet, by mules; and from incline to railroad, a distance of 500 feet, by gravity.

ANDERSON COUNTY.

Taft Mine—*Owner*, Coal Creek Mining & Mfg. Co., Knoxville; *Operator*, Coal Creek Coal Co. (under contract with W. H. Branscom and G. M. Camp), Coal Creek; *President*, E. C. Camp, Knoxville; *Secretary*, H. M. Camp, Knoxville; *Inside Foreman*, G. W. Bennett, Coal Creek.

This is a Class C drift mine, located 990 feet above sea level, in Cumberland Mountain, $2\frac{1}{2}$ miles from Coal Creek, and connects with Southern Railroad. The Coal Creek seam, having an average thickness of 78 inches, is worked. The roof and bottom are both slate. It is developed on the single entry system. Ventilation is produced by natural conditions. Haulage is conducted from room to tippie, a distance of 1,800 feet, by mules.

ANDERSON COUNTY.

Tennessee Mine—*Owner*, Coal Creek Mining & Mfg. Co., Knoxville; *Operator*, Tennessee Coal Co., Knoxville; *President*, Geo. P. Chandler, Knoxville; *Secretary*, Hugh L. McClung, Knoxville; *Inside Foreman*, Abe Goins, Briceville.

This is a Class B drift mine, located 972 feet above sea level, in Cumberland Mountain, 4 miles from Coal Creek, and connects with Southern Railroad. The Coal Creek seam, having an average thickness of 48 inches, is worked. The roof is slate and shale and the bottom slate. It is developed on the double entry, room and pillar system. Ventilation is produced by fan with a diameter of 16 feet, and is distributed by the double entry system. Haulage is conducted from rooms to parting, a distance of 2,000 feet, by mules, and from parting to tippie, a distance of 5,000 feet, by rope.

ANDERSON COUNTY.

Thistle No. 1-2 Mine—*Owner*, Coal Creek Mining and Mfg. Co., Knoxville; *Operator*, Coal Creek Coal Co., Knoxville; *President*, E. C. Camp, Knoxville; *Secretary*, H. M. Camp, Knoxville; *Inside Foreman*, W. H. Branscom, Coal Creek; *Gas Boss*, H. V. Stone, Coal Creek.

This is a Class B mine, located 980 feet above sea level, in Cumberland Mountain, 3 miles from Coal Creek, and connects with Southern Railroad. The Coal Creek seam, having an average thickness of 42 inches, is worked. The roof is slate and sandstone and the bottom slate and fire clay. It is developed on the single entry system. Ventilation is produced by fan with a diameter of 16 feet, and is distributed by the airway and split system. Haulage is conducted in No. 1 from headings and rooms to sidetrack, a distance of 3,000 feet, by mules; and from sidetrack to tippie, a distance of 3,000 feet, by mules; and in No. 2, from rooms to tippie, a distance of 1,800 feet, by mules.

ANDERSON COUNTY.

Windrock No. 1 Mine—*Owner*, Bessemer Coal, Iron & Land Co., Bessemer, Ala.; *Operator*, Windrock Coal & Coke Co., Windrock; *President*, H. L. Badham, Birmingham, Ala.; *Secretary*, R. E. Evans, Bessemer, Ala.; *Inside Foreman*, R. H. Wolford, Windrock.

This is a Class C mine, located 2,400 feet above sea level, in Windrock Mountain, 3 miles from Oliver Springs, and connects with L. & N. Railroad. The Dean seam, having an average thickness of 57 inches, is worked. The roof is slate and sandstone and the bottom fire clay. It is developed on the panel system. Ventilation is produced by fan with a diameter of 6 feet, and is distributed by the split system. Haulage is conducted from face of all butts to main butt, a distance of 2,000 feet, by electric motors; and from main butt to outside, a distance of 1,200 feet, by electric motors. Length of incline, 4,400 feet.

BLEDSOE COUNTY.

Atpontley No. 1 Mine—*Owner and Operator*, Atpontley Coal Co., Atpontley; *President*, John B. Atkinson, Earlington, Ky.; *Secretary*, Paul M. Moore, Earlington, Ky.; *Inside Foreman*, H. G. Smith, Atpontley.

This is a Class C drift mine, located 1,500 feet above sea level, in Cumberland Mountain $\frac{3}{4}$ mile from Atpontley, and connects with N., C. & St. L. Railroad. The Sewanee seam, having an average thickness of 34 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the single entry, room and pillar system. Ventilation is produced by furnace with a grate area of 42 feet. Haulage is conducted from face of entry to head of incline, a distance of 1,200 feet, by mules; from head of incline to railroad tippie, a distance of 4,200 feet, by gravity.

BLEDSOE COUNTY.

Atpontley No. 2 Mine—Owner and Operator, Atpontley Coal Co., Atpontley; *President*, John B. Atkinson, Earlington, Ky.; *Secretary*, Paul M. Moore, Earlington, Ky.; *Inside Foreman*, H. G. Smith, Atpontley.

This is a Class C drift mine, located 1,500 feet above sea level, in Cumberland Mountain, $\frac{3}{4}$ mile from Atpontley, and connects with N., C. & St. L. Ry. The Sewanee seam, having an average thickness of 34 inches, is worked. The roof is slate and sandstone and the bottom fire clay. It is developed on the single entry, room and pillar system. Ventilation is produced by fan with a diameter of six feet. Haulage is conducted from sidetrack to head of incline, a distance of 1,500 feet, by mules; from head of incline to tippie at railroad, a distance of 4,200 feet, by gravity.

BLEDSOE COUNTY.

Atpontley No. 6 Mine—Owner and Operator, Atpontley Coal Co., Atpontley; *President*, John B. Atkinson, Earlington, Ky.; *Secretary*, Paul M. Moore, Earlington, Ky.; *Inside Foreman*, H. G. Smith, Atpontley.

This is a Class C drift mine, located 1,500 feet above sea level, in Cumberland Mountain $\frac{3}{4}$ mile from Atpontley, and connects with N., C. & St. L. Ry. The Sewanee seam, having an average thickness of 34 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the single entry, room and pillar system. Ventilation is produced by furnace with a grate area of 48 feet. Haulage is conducted from inner sidetrack to small incline, a distance of 1,000 feet, by mules; from head of small incline to head of main incline, a distance of 400 feet, by gravity; from head of main incline to railroad tippie, a distance of 4,200 feet, by gravity.

CAMPBELL COUNTY.

Anchor Mine—Owner and Operator, Anchor Coal Co., Knoxville; *President*, J. D. Raht, Knoxville; *Secretary*, H. J. Merwin, Knoxville; *Inside Foreman*, George Pickel, Morley.

This is a class C mine, located 1,400 feet above sea level, in Cumberland Mountain, 1 mile from Morley, and connects with L. & N. Railroad. The Kramor seam, having an average thickness of 34 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the room and pillar system. Ventilation is produced by a fan with a diameter of 8 feet, and is distributed as continuous current. Haulage is conducted from mouth of rooms to knuckle, a distance of 1,500 feet, by mules.

CAMPBELL COUNTY.

Arnett Lone Mt. Mine—Owner and Operator, C. T. Arnett and S. M. Hale, Newcomb; *Inside Foreman*, S. M. Hale.

This is a Class C drift mine, located 1,275 feet above sea level, in Nigrous Mountain, 1 mile from Newcomb, and connects with Southern Railroad. The Blue Gem seam, having an average thickness of 20 inches, is worked. The roof and bottom are both slate. It is developed on the room and pillar system. Ventilation is produced by natural conditions. Haulage is conducted from rooms to tippie, a distance of — feet, by mules.

CAMPBELL COUNTY.

Baird Blue Gem Mine—Owner and Operator, Lewis Baird, Elk Valley; *President*, Lewis Baird, Elk Valley; *Inside Foreman*, Aaron Baird, Elk Valley.

This is a class C drift mine, located 1,250 feet above sea level, in Jellico Mountain, $1\frac{1}{4}$ miles from Elk Valley, and connects with Southern Railroad. The Blue Gem seam, having an average thickness of 22 inches, is worked. The roof is rock and the bottom slate. It is developed on the drift system. Ventilation is produced by furnace with a grate area of 20 feet. Haulage is conducted from rooms to tippie, a distance of 300 feet, by mules.

CAMPBELL COUNTY.

Bear Wallow Mine—*Owner*, Bowling, Boyd & Carter, Careyville; *Operator*, Bear Wallow Coal Co., Careyville; *President*, H. B. Bowling, Clinton; *Secretary*, J. L. Boyd, Knoxville; *Inside Foreman and Gas Boss*, C. E. Sampsel, Careyville.

This is a Class A slope mine, located 1,050 feet above sea level, in Cumberland Mountain, $\frac{1}{2}$ mile from Careyville, and connects with Southern Railroad. The Coal Creek seam, having an average thickness of 42 inches, is worked. The roof is sandstone and slate and the bottom slate. It is developed on the single entry system. Ventilation is produced by fan with a diameter of 8 feet. Haulage is conducted from bottom of slope to heading, a distance of 1,400 feet, by mules; from rooms to bottom of slope, a distance of 1,400 feet, by mules; from bottom of slope to tippie, a distance of 150 feet, by engine.

CAMPBELL COUNTY.

Big Block Mine—*Owner*, A. Goldberg, Cupp; *Operator*, Big Block Coal Co., Cupp; *President*, A. Goldberg, Cupp; *Inside Foreman*, Frank Matthey, Cupp.

This is a Class C drift mine, located 1,275 feet above sea level, in Cumberland Mountain, 1 mile from Cupp, and connects with Louisville & Nashville Railroad. The Jellico, seam, having an average thickness of 34 inches, is worked. The roof is sandstone and the bottom slate. It is developed on the single entry system. Ventilation is produced by fan with a diameter of 6 feet, and is distributed by the split system. Haulage is conducted from rooms to sidetrack, a distance of 700 feet, by mules; and from sidetrack to tippie, a distance of 450 feet, by steam engine.

CAMPBELL COUNTY.

Black Gem Mine—*Owner and Operator*, Black Gem Coal Co., Knoxville; *President*, T. W. Keller, Knoxville; *Secretary*, W. F. Park, Knoxville.

This is a Class A slope mine, with a dip of 3 to 15 per cent., located 1,050 feet above sea level, in Cumberland Mountain, $\frac{1}{4}$ mile from Careyville, and connects with Southern Railroad. The Coal Creek seam, having an average thickness of 38 inches, is worked. The roof is slate and the bottom fire clay. The plan or system of development has not yet been defined. Ventilation is produced by fan with a diameter of 10 feet, and is distributed as continuous current.

CAMPBELL COUNTY.

Block No. 2 Mine—*Owner and Operator*, Block Coal & Coke Co., Block; *President*, Robert Wedikind, Louisville, Ky.; *Secretary*, W. G. Polk, Louisville, Ky.; *Inside Foreman*, P. F. Gorman, Block.

This is a Class B drift mine, located 2,000 feet above sea level, in Cross Mountain, $\frac{1}{2}$ mile from Block, and connects with Southern Railroad. The Block seam, having an average thickness of 36 inches, is worked. The roof is slate and sandstone, and the bottom slate. It is developed on the single entry, room and pillar system. Ventilation is produced by fan with a diameter of 4 feet, and is distributed as direct current. Haulage is conducted from rooms to incline, a distance of 2,000 feet, by mules; from top of incline 2 to bottom of incline 2, a distance of 600 feet, by drum; from bottom of incline 2 to top of incline 1, a distance of 2,000 feet, by electric motors; from top of incline 1 to railroad, a distance of 2,500 feet, by monitor cars.

CAMPBELL COUNTY.

Block No. 3 Mine—*Owner and Operator*, Block Coal & Coke Co., Knoxville; *President*, Robert Wedikind, Louisville, Ky.; *Secretary*, W. G. Polk, Louisville, Ky.; *Inside Foreman*, P. F. Gorman, Sr., Block.

This is a Class B drift mine, located 2,200 feet above sea level, in Cross Mountain, $\frac{1}{2}$ mile from Block, and connects with Southern Railroad. The Block or Big Mary seam, having an average thickness of 36-70 inches, is worked. The roof is slate and sandstone and the bottom slate. It is developed on the single entry, room and pillar system. Ventilation is produced by fan with a diameter of 10 feet, and is distributed as continuous current. Haulage is conducted from rooms to top of incline 2, a distance of 1,500 feet, by electric motors; from top of incline 2 to bottom of incline 2, a distance of 1,300 feet, by drum; from bottom of incline 2 to top of incline 1, a distance of 2,500 feet, by electric motors; from top of incline 1 to railroad, a distance of 2,500 feet, by monitor cars.

CAMPBELL COUNTY.

Block Monarch Mine—*Owner and Operator*, Block Coal & Coke Co., Knoxville;

President, Robert Wedikind, Louisville, Ky.; *Secretary*, Wm. G. Polk, Louisville, Ky.; *Inside Foreman*, P. F. Gorman, Sr., Block.

This is a Class B mine, located 2,700 feet above sea level, in Cross Mountain, 44 miles from Knoxville, and connects with Southern Railroad. The Monarch seam, having an average thickness of 72 inches, is worked. The roof is hard slate and the bottom slate. It is developed on the double entry, room and pillar system. Ventilation is produced by fan with a diameter of 21 feet, and is distributed as continuous current. There will be electric haulage throughout when put into operation.

CAMPBELL COUNTY.

Blue Gem (Speed) Mine—Owner and Operator, Blue Gem Coal Co., Jellico; *President*, J. E. Moses, Jellico; *Secretary*, L. Solomon, Louisville, Ky.; *Inside Foreman*, Wm. McNelis, Jellico.

This is a Class A drift mine, located 1,000 feet above sea level, in Pine Mountain, 1½ miles from Jellico, and connects with Southern Railroad. The Blue Gem seam, having an average thickness of 26 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the single entry, room and pillar system. Ventilation is produced by furnace, with a grate area of 30 feet, and by natural conditions. Haulage is conducted from rooms to knuckle, a distance of 1,100 feet, by mules; and from knuckle to incline, a distance of 200 feet, by mules.

CAMPBELL COUNTY.

Cambria Mine—Owner, Coal Creek Mining & Mfg. Co., Knoxville; *Operator*, Royal Coal & Coke Co., Knoxville; *President*, H. S. Pless, Knoxville; *Secretary*, W. A. Pless, Knoxville; *Inside Foreman*, Chas E. Bell, Coal Creek.

This is a Class A drift mine, located 1,136 feet above sea level, in Cumberland Mountain, 3 miles from Coal Creek, and connects with Southern Railroad. The Coal Creek seam, having an average thickness of 40 inches, is worked. The roof is fire clay and slate and the bottom fire clay. It is developed on the double entry, room and pillar system. Ventilation is produced by fan with a diameter of 20 feet, and is distributed by the split system. Haulage is conducted from rooms to sidetrack, a distance of 2,500 feet, by mules; and from sidetrack to chute, a distance of 4,200 feet, by rope.

CAMPBELL COUNTY.

Careyville Mine—Owner, East Tennessee Iron & Coal Co., Knoxville; *Operator*, Careyville Coal Co., Careyville; *President*, Thomas H. Gill, Milwaukee, Wis.; *Secretary*, J. H. McManaman, Careyville; *Inside Foreman*, J. W. Duncan, Careyville.

This is a Class C mine, located 2,447 feet above sea level, in Cumberland Mountain, 2 miles from Careyville, and connects with Southern Railroad. The Block seam, having an average thickness of 46 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the double entry, room and pillar system. Ventilation is produced by fan with a diameter of 8 feet, and is distributed as continuous current. Haulage is conducted from sidetrack to upper tippie, a distance of 500 feet, by mules; from tippie to tippie at railroad, a distance of 5,980 feet, by gravity incline.

CAMPBELL COUNTY.

Chaska Mine—Owner and Operator, Chaska Coal Co., Knoxville; *President*, F. B. Cooley, Sr., Knoxville; *Secretary*, W. M. Sexton, Knoxville; *Inside Foreman*, J. W. Pavne, Chaska.

This is a Class C drift mine, located 1,500 feet above sea level, in White Oak Mountain, ½ mile from Chaska, and connects with L. & N. Railroad. The Rich Mountain seam, having an average thickness of 43 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the single entry and airway system. Ventilation is produced by furnace with a grate area of 25 feet, and is distributed as continuous current. Haulage is conducted from rooms to sidetrack, a distance of 1,200 feet by mules; and from sidetrack to drum, a distance of 2,150 feet, by mules; length of incline, 750 feet.

CAMPBELL COUNTY.

Davis Creek No. 1 Mine—Owner, G. W. Parrott, Atlanta, Ga.; *Operator*, Davis Creek Coal Co., Cuypp; *President*, G. W. Parrott, Atlanta, Ga.; *Secretary*, G. W. Stephenson, Jellico; *Inside Foreman*, John Facinoli, Cuypp.

This is a Class C drift mine, located 1,975 feet above sea level, in Cumberland Mountain ½ mile from Cuypp, and connects with L. & N. Railroad. The Rich Moun-

tain seam, having an average thickness of 36 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the double entry system. Ventilation is produced by furnace with a grate area of 25 feet, and is distributed as continuous current. Haulage is conducted from rooms to knuckle 1, a distance of 900 feet, by mules; from Knuckle 1 to bottom of incline, a distance of 750 feet, by rope; from bottom of incline to knuckle 2, a distance of 200 feet, by mules; from knuckle 2 to tippie, a distance of 100 feet, by rope.

CAMPBELL COUNTY.

Davis Creek No. 2 Mine—Owner, G. W. Parrott, Atlanta, Ga.; Operator, Davis Creek Coal Co., Cupp; President, G. W. Parrott, Atlanta, Ga.; Secretary, G. W. Stephenson, Jellico; Inside Foreman, John Facinoli, Cupp.

This is a Class C drift mine, located 1,275 feet above sea level, in Cumberland Mountain, $\frac{1}{2}$ mile from Cupp, and connects with L. & N. Railroad. The Rich Mountain seam, having an average thickness of 36 inches, is worked. The roof is slate and sandstone and the bottom fire clay. It is developed on the single entry system. Ventilation is produced by furnace with a grate area of 25 feet, and is distributed as continuous current. Haulage is conducted from rooms to knuckle, a distance of 700 feet, by mules; and from knuckle to tippie, a distance of 1,000 feet, by incline.

CAMPBELL COUNTY.

Elkhart B. G. Mine—Owner, Andrew Lawson's heirs; Operator, Elkhart Blue Gem Coal Co., Elk Valley; President, G. P. Norman, Briceville; Secretary, J. C. Wallace, Clinton; Inside Foreman, Frank Baird, Elk Valley.

This is a Class C drift mine, located 2,100 feet above sea level, in Cumberland Mountain, $\frac{1}{2}$ mile from Elk Valley, and connects with Southern Railroad. The Blue Gem seam, having an average thickness of 21 inches, is worked. The roof is slate and the bottom rock. Ventilation is produced by natural conditions, and there is no defined plan or system of works. Haulage is conducted from inside to chute, a distance of 1,000 feet, by mules; and from chute to railroad sidetrack, a distance of 1,450 feet, by mules.

CAMPBELL COUNTY.

Elk Valley Mine—Owner and Operator, Elk Valley Coal Mining Co., Elk Valley; President, F. W. Shibley, New York City; Secretary, Roby Robinson, Atlanta, Ga.; Inside Foreman, George Bell, Elk Valley.

This is a Class B drift mine, located 2,100 feet above sea level, in Jellico Mountain, $\frac{1}{2}$ mile from Elk Valley, and connects with Southern Railroad. The Splint seam, having an average thickness of 32 inches, is worked. The roof is rock and slate and the bottom fire clay. It is developed on the single entry and single room system. Ventilation is produced by furnace with a grate area of 42 feet, and is distributed as continuous current. Haulage is conducted from rooms to knuckle, a distance of 3,800 feet by mules, from knuckle to tramway, a distance of 300 feet, by gravity incline; from tramway to drum house or knuckle 2, a distance of 9,000 feet, by dinky engine; and from knuckle 2 to chute at railroad, a distance of 1,000 feet, by gravity incline.

CAMPBELL COUNTY.

Evans Mine—Owner and Operator, Evans Coal Co., Knoxville; President, M. F. Evans, Louisville, Ky.; Secretary, W. G. Polk, Louisville, Ky.; Inside Foreman, Perry Gorman, Jr., Jellico.

This is a Class C drift mine, located 1,200 feet above sea level, in Pine Mountain, $\frac{3}{4}$ mile from Jellico, and connects with Southern Railroad. The Blue Gem seam, having an average thickness of 24 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the single entry, room and pillar system. Ventilation is produced by furnace with a grate area of 25 feet. Haulage is conducted from rooms to sidetrack, a distance of 400 feet, by mules; from sidetrack to knuckle, a distance of 300 feet, by mules; and from knuckle to railroad, a distance of 500 feet, by incline.

CAMPBELL COUNTY.

Falls Branch Mine—Owner and Operator, Falls Branch Coal Co., Woolridge; President, P. Woolridge, Louisville, Ky.; Inside Foreman, J. W. Howe, Woolridge.

This is a Class C drift mine, located 1,250 feet above sea level, in Jellico Mountain, 2 miles from Woolridge, and connects with Southern Railroad. The Jellico seam, having an average thickness of 40 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the single and double entry system. Ventilation is

produced by fan with a diameter of 8 feet, and is distributed by the split system. Haulage is conducted from rooms to No. 2 sidetrack, a distance of 2,000 feet, by mules; from No. 2 sidetrack to outside track, a distance of 2,500 feet, by 9-ton engine; and from outside track to knuckle, a distance of 5,200 feet, by locomotive.

CAMPBELL COUNTY.

Gem Mine—Owner and Operator, LaFollette Coal, Iron & Ry. Co., LaFollette; *President*, H. M. LaFollette, LaFollette; *Secretary*, J. H. Creekmore, LaFollette; *Inside Foreman*, Joseph Rigby, Peabody.

This is a Class C drift mine, located 1,998 feet above sea level, in Rock Creek Mountain, $\frac{3}{4}$ mile from Peabody, and connects with L. & N. Railroad. The Jordan seam, having an average thickness of 48 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the single entry, and airway system. Ventilation is produced by fan with a diameter of 6 feet and by furnace with a grate area of 30 feet, and is distributed as continuous current. Haulage is conducted from room necks to outside sidetrack, a distance of 2,500 feet, by electric motors; and from sidetrack to tippie, a distance of 3,850 feet, by endless rope incline.

CAMPBELL COUNTY.

Indian Mt. No. 1 Mine—Owner, East Tennessee Coal Co., Jellico; *Operator*, Proctor Coal Co., Red Ash, Ky.; *President*, Charles Finley, Williamsburg, Ky.; *Secretary*, F. W. Finley, Williamsburg, Ky.; *Inside Foreman*, Sam Parry, Red Ash, Ky.

This is a Class B mine, located 1,300 feet above sea level, in Indian Mountain, 1 mile from Jellico, Tenn., and connects with Southern and L. & N. Railroads. The Jellico seam, having an average thickness of 42 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the single entry, room and pillar system. Ventilation is produced by fan with a diameter of 11 feet, and is distributed by the split system. Haulage is conducted from rooms to entry, a distance of 200 feet, by miners; from entry to drum house, a distance of 3,900 feet, by motors; from drum house to tip, a distance of 700 feet, by incline; and from tip to cars, a distance of 50 feet by chute.

CAMPBELL COUNTY.

Indian Mt. No. 2 Mine—Owner, East Tennessee Coal Co., Jellico; *Operator*, Proctor Coal Co., Red Ash, Ky.; *President*, Charles Finley, Williamsburg, Ky.; *Secretary*, F. W. Finley, Williamsburg, Ky.; *Inside Foreman*, Sam Parry, Red Ash, Ky.

This is a Class B mine, located 1,300 feet above sea level, in Indian Mountain, 1 mile from Jellico, Tenn., and connects with Southern and L. & N. Railroads. The Jellico seam, having an average thickness of 42 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the single entry, room and pillar system. Ventilation is produced by fan with a diameter of 11 feet, and is distributed by the split system. Haulage is conducted from rooms to entry, a distance of 200 feet, by miners; from entry to drum house, a distance of 2,500 feet, by motors; from drum house to tip, a distance of 700 feet, by incline; and from tip to cars, a distance of 50 feet, by chute.

CAMPBELL COUNTY.

Italian B. G. Mine—Owner, Italian Blue Gem Co., Newcomb; *Operator*, Zechini Coal Co., Newcomb; *President*, Peter Zechini, Newcomb; *Secretary*, W. H. Jenkins, Newcomb; *Inside Foreman*, Dod Bradden, Newcomb.

This is a Class B drift mine, located 1,200 feet above sea level, in Pine Mountain, two miles from Newcomb, and connects with Southern Railroad. The Blue Gem seam, having an average thickness of 22 inches, is worked. The roof is slate and the bottom slate and fire clay. It is developed on the single entry and double room system. Ventilation is produced by fan with a diameter of 4 feet. Haulage is conducted from room to drum, a distance of 3,250 feet, by mules; and from drum to chute at railroad, a distance of 1,150 feet, by gravity.

CAMPBELL COUNTY.

Italy Mine—Owner, J. S. Bartlett & H. M. LaFollette, LaFollette; *Operator*, Italy Coal Co., Jellico; *President*, R. B. Baird, Jellico; *Secretary*, C. O. Baird, Jellico; *Inside Foreman*, G. B. Keys, Cupp.

This is a class C drift mine, located 1,275 feet above sea level, in Rich Mountain, $\frac{1}{2}$ mile from Cupp, and connects with Louisville & Nashville Railroad. The Jellico seam, having an average thickness of 28 inches, is worked. The roof is slate and the

bottom fire clay. It is developed on the single entry system. Ventilation is produced by fan with a diameter of 4 feet, and is distributed by airways and break throughs. Haulage is conducted from rooms to sidetrack, a distance of 700 feet, by mules, and from sidetrack to tippie, a distance of 700 feet, by mules.

CAMPBELL COUNTY.

Jackson No. 1 Mine—Owner, R. O. Campbell Coal Co., Atlanta, Ga.; Operator, Campbell Coal Mine Co., Westbourne; President, R. O. Campbell, Atlanta, Ga.; Superintendent, J. D. Cain, Westbourne; Inside Foreman, J. P. Fortune, Westbourne.

This is a Class C drift mine, located 1,400 feet above sea level, in Log Mountain, $\frac{1}{4}$ mile from Westbourne, and connects with L. & N. Railroad. The Log Mountain seam, having an average thickness of 48 inches, is worked. The roof is slate and the bottom fire clay and rock. It is developed on the room and pillar system. Ventilation is produced by fan with a diameter of 7 feet, and is distributed as continuous current. Haulage is conducted from rooms to sidetrack, a distance of 1,200 feet, by mules; from sidetrack to tippie, a distance of 1,210 feet, by mules; and from tippie to railroad, a distance of 1,232 feet, by gravity incline.

CAMPBELL COUNTY.

Jellico B. G. Mine—Owner and Operator, Jellico B. G. Coal Co., Jellico; President, J. S. Jones, Jellico; Secretary, J. S. Jones, Jellico; Inside Foreman, H. M. Jones, Jellico.

This is a Class B drift mine, located 1,200 feet above sea level, in Pine Mountain, $1\frac{1}{2}$ miles from Jellico, and connects with Southern Railroad. The Blue Gem seam, having an average thickness of 24 inches, is worked. The roof is slate and the bottom slate and clay. It is developed on the double entry system. Ventilation is produced by furnace, with a grate area of 36 feet, and is distributed by cross cuts. Haulage is conducted from headings to outside, a distance of 1,200 feet, by mules; from outside to knuckle, a distance of 3,000 feet, by mules; and from knuckle to tippie, a distance of 1,400 feet, by incline.

CAMPBELL COUNTY.

Kimberly Mine—Owner and Operator, Kimberly Mining & Mfg. Co., Knoxville; President, J. K. Griffin, Knoxville; Secretary, B. A. Morton, Knoxville; Inside Foreman, B. F. Smith, Cupp.

This is a Class C drift mine, located 1,555 feet above sea level, in Cumberland Mountain, 1 mile from Cupp, and connects with L. & N. Railroad. The Rich Mountain seam, having an average thickness of 38 inches, is worked. The roof is slate and the bottom sandstone. It is developed on the double entry, room and pillar system. Ventilation is produced by furnace, with a grate area of 36 feet, and is distributed by the multiple system. Haulage is conducted from heading to knuckle, a distance of 4,200 feet, by mules; and from knuckle to tip house, a distance of 700 feet, by gravity incline.

CAMPBELL COUNTY.

Layne Mine—Owner, Operator and President, M. H. Lane, Newcomb; Inside Foreman, Lee Rigney, Newcomb.

This is a Class D drift mine, operated under lease, and located 1,200 feet above sea level, in Nigrous Mountain, 2 miles from Newcomb, and connects with the Southern Railroad. The Blue Gem seam, having an average thickness of 23 inches, is worked. The roof is rock and the bottom fire clay. Ventilation is produced by natural conditions, but there is no defined system of development. Haulage is conducted by mules a distance of 200 feet by hand.

CAMPBELL COUNTY.

Mary-Anna Mine—Owner and Operator, Wooldridge-Jellico Coal Co., Wooldridge; President, P. Wooldridge, Pee-wee Valley, Ky.; Secretary, A. G. Pettes, Wooldridge; Inside Foreman, Thomas H. Griffith, Wooldridge.

This is a Class C drift mine, located 1,225 feet above sea level, in Jellico Mountain, $1\frac{7}{8}$ miles from Wooldridge, and connects with Southern Railroad. The Jellico seam, having an average thickness of 36 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the single entry system. Ventilation is produced by fan with a diameter of 8 feet, and is distributed as continuous current. Haulage is conducted from rooms to sidetrack, a distance of 1,500 feet, by mules; from sidetrack

to general sidetrack, a distance of 2,000 feet, by motors; from general sidetrack to knuckle, a distance of 2,200 feet, by mules; from knuckle to tippie, a distance of 316 feet, by gravity; and from tippie to railroad, a distance of 224 feet, by gravity.

CAMPBELL COUNTY.

Morley Mine—Owner and Operator, Morley Coal Co., Morley; President, W. F. Park, Morley; Secretary, J. M. Hartman, Morley; Inside Foreman, George Easley, Morley.

This is a Class B drift mine, located 1,370 feet above sea level, in Cumberland Mountain, $3\frac{1}{2}$ miles from Jellico, and connects with L. & N. Railroad. The Kramor seam, having an average thickness of 34 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the single entry, room and pillar system. Ventilation is produced by furnace, with a grate area of 48 feet, and is distributed as continuous current. Haulage is conducted from rooms to knuckle, an average of 400 feet, by mules; from knuckle to tippie, a distance of 800 feet, by gravity incline; and from tippie to railroad, a distance of 5,280 feet, by locomotive.

CAMPBELL COUNTY.

Powhattan Mine—Owner and Operator, Falls Branch Coal Co., Wooldridge; President, P. Wooldridge, Wooldridge; Inside Foreman, J. H. Howe, Wooldridge.

This is a Class C drift mine, located 1,160 feet above sea level, in Jellico Mountain, $1\frac{1}{2}$ miles from Wooldridge, and connects with Southern Railroad. The Blue Gem seam, having an average thickness of 24 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the single entry system. Ventilation is produced by natural conditions. Haulage is conducted from rooms to knuckle, a distance of 3,000 feet, by mules.

CAMPBELL COUNTY.

Red Ash Mine—Owner, East Tennessee Iron & Coal Co., Knoxville; Operator, Red Ash Coal Co., Careyville; President, C. M. Moore, Careyville; Secretary, G. B. Galaher, Careyville; Inside Foreman, T. D. Richards, Careyville.

This is a Class C drift mine, located 2,450 feet above sea level, in Cumberland Mountain, 1 mile from Careyville, and connects with Southern Railroad. The Red Ash seam, having an average thickness of 42 inches, is worked. The roof is slate and the bottom slate and clay. It is developed on the double entry system. Ventilation is produced by furnace, with a grate area of 96 feet, and is distributed as continuous current. Haulage is conducted from face of entry to sidetracks, a distance of 1,650 feet, by mules; and from sidetrack to tippie, a distance of 1,800 feet, by motors; where the coal is tipped into 10-ton monitor cars and conveyed to chute at railroad over two sections of incline, the first section working by gravity and the second section by an engine plane. Distance from No. 2 main entry to tippie is 2,600 feet.

CAMPBELL COUNTY.

Remy Mine—Owner and Operator, Remy Coal Co., Gatliff; President, J. D. Wheeler, Gatliff; Secretary, W. B. Siler, Gatliff; Inside Foreman, L. W. Sharp, Gatliff.

This is a Class C drift mine, located 1,275 feet above sea level, in Log Mountain, $\frac{1}{2}$ mile from Gatliff, and connects with L. & N. Railroad. The Rich Mountain seam, having an average thickness of 36 inches, is worked. The roof is slate and the bottom slate and clay. It is developed on the double entry system. Ventilation is produced by fan with a diameter of 4 feet, and is distributed as continuous current. Haulage is conducted from head of main entry to knuckle, a distance of 2,000 feet, by mules; and from knuckle to tippie, a distance of 1,100 feet, by gravity incline.

CAMPBELL COUNTY.

Rex No. 1 Mine—Owner and Operator, LaFollette Coal, Iron & Ry. Co., LaFollette; President, H. M. LaFollette, LaFollette; Inside Foreman, H. Bevan, LaFollette; Gas Gas Boss, Dave Ward, LaFollette.

This is a Class A slope mine, located 1,000 feet above sea level, in Cumberland Mountain, 1 mile from LaFollette, and connects with L. & N. and Southern Railroads. The Rex seam, having an average thickness of 44 inches, is worked. The roof is slate, and the bottom fire clay and slate. It is developed on the double entry, room and pillar system. Ventilation is produced by two fans, with diameters of 8 and 13

feet, and is distributed as continuous current with two splits. Haulage is conducted from rooms in cross entry to main entry, a distance of 800 feet, by mules; from main entry to slope, a distance of 400 feet, by mules, and from slope to tippie, a distance of 1,950 feet, by engine hoist.

CAMPBELL COUNTY.

Rex No. 2 Mine—Owner and Operator, LaFollette Coal, Iron & Ry. Co., LaFollette; President, H. M. LaFollette, LaFollette; Inside Foreman, Chas. Wood, LaFollette; Gas Boss, Harry Kuntz, LaFollette.

This is a Class A slope mine, with a pitch of 19 degrees, located 1,000 feet above sea level, in Cumberland Mountain, 1 mile from LaFollette, and connects with L. & N. and Southern Railroads. The Rex seam, having an average thickness of 44 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the double entry, room and pillar system. Ventilation is produced by two fans, with diameters of 8 and 12 feet, and is distributed by the split system. Haulage is conducted from rooms on cross entry to main entry, a distance of 500 feet, by mules; from main entry to slope, a distance of 1,000 feet, by mules, and from slope to tippie, a distance of 1,000 feet, by hoist engine.

CAMPBELL COUNTY.

Rich Mountain No. 1 Mine—Owner and Operator, Rich Mountain Coal & Coke Co., Bennett; President, H. W. Tillery, Bennett; Superintendent, H. W. Tillery, Bennett; Inside Foreman, L. Koontz, Bennett.

This is a Class C drift mine, operated under lease, and located 1,275 feet above sea level, in Rich Mountain, $\frac{1}{2}$ mile from Bennett, and connects with L. & N. Railroad. The Rich Mountain seam, having an average thickness of 33 inches, is worked. The roof and bottom are both slate. It is developed on the single entry, room and pillar system. Ventilation is produced by fan, with a diameter of 12 feet. Haulage is conducted from rooms to sidetrack, a distance of 800 feet, by mules; from sidetrack to tippie, a distance of 700 feet, by rope, and from tippie to railroad, a distance of 4,200 feet, by gravity incline.

CAMPBELL COUNTY.

Rich Mountain No. 2 Mine—Owner and Operator, Rich Mountain Coal & Coke Co., Bennett; President, H. W. Tillery, Bennett; Secretary, J. G. Howell, Knoxville; Inside Foreman, Lum Koontz, Bennett.

This is a Class C drift mine, located 1,270 feet above sea level, in Rich Mountain, 1 mile from Cupp, and connects with L. & N. Railroad. The Rich Mountain seam, having an average thickness of 32 inches, is worked. The roof is slate and the bottom slate and fire clay. It is developed on the single entry system. Ventilation is produced by fan, with a diameter of 12 feet, and is distributed as continuous current. Haulage is conducted from rooms to sidetrack, a distance of 1,000 feet, by mules; from sidetrack to tippie, a distance of 700 feet, by rope, and from tippie to chute at railroad, a distance of 4,200 feet, by incline.

CAMPBELL COUNTY.

Royal (Old) Mine—Owner, Coal Creek Mining & Mfg. Co., Knoxville; Operator, Royal Coal & Coke Co., Knoxville; President, H. S. Pless, Knoxville; Secretary, W. A. Pless, Knoxville; Inside Foreman, M. B. Redmon, Coal Creek.

This is a Class C drift mine, located 1,065 feet above sea level, in Cumberland Mountain, $2\frac{1}{2}$ miles from Coal Creek, and connects with Southern Railroad. The Coal Creek seam, having an average thickness of 46 inches, is worked. The roof and bottom are both fire clay. This mine is being robbed. Ventilation is produced by split from cambria fan. Haulage is conducted from rooms to chute, a distance of 1,200 feet, by mules.

CAMPBELL COUNTY.

Southern No. 1 Mine—Owner and Operator, Southern Coal & Coke Co., Gatliff; President, Dr. A. Gatliff, Williamsburg, Ky.; Secretary, E. C. Mahan, Knoxville; Inside Foreman, J. C. Babb, Gatliff.

This is a Class C drift mine, located 1,800 feet above sea level, in Brushy Mountain, $\frac{1}{2}$ mile from Gatliff, and connects with L. & N. Railroad. The Jordon seam, having an average thickness of 54 inches, is worked. The roof is sandstone and shale and the bottom fire clay and shale. It is developed on the single entry and

airway system. Ventilation is produced by furnace, with a grate area of 58 feet, and is distributed as direct current. Haulage is conducted from rooms to sidetrack, a distance of 1,800 feet, by mules; from sidetrack to knuckle, a distance of 1,100 feet, by mules, and from knuckle to tiphouse, a distance of 1,800 feet, by incline.

CAMPBELL COUNTY.

Southern No. 2 Mine—Owner and Operator, Southern Coal & Coke Co., Gatliff; *President*, Dr. A. Gatliff, Williamsburg, Ky.; *Secretary*, E. C. Mahan, Knoxville; *Inside Foreman*, J. C. Babb, Gatliff.

This is a Class C drift mine, located 1,800 feet above sea level, in Brushy Mountain, $\frac{1}{2}$ mile from Gatliff, and connects with L. & N. Railroad. The Jordan seam, having an average thickness of 54 inches, is worked. The roof is sandstone and shale and the bottom fire clay and shale. It is developed on the single entry and airway system. Ventilation is produced by furnace, with a grate area of 58 feet, and is distributed as direct current. Haulage is conducted from rooms to sidetrack, a distance of 1,700 feet, by mules; from sidetrack to general sidetrack, a distance of 940 feet, by mules; from general sidetrack to knuckle, a distance of 1,490 feet, by mules, and from knuckle to tippie, a distance of 1,800 feet, by incline.

CAMPBELL COUNTY.

Sun Mine—Owner, Lindsay Land Co., Knoxville; *Operator*, Sun Coal Co., Careyville; *President*, J. H. Bowling, Careyville; *Secretary*, M. A. Jacobs, Careyville; *Inside Foreman*, Lige Robinson, Careyville.

This is a Class C drift mine, located 2,425 feet above sea level, in Cumberland Mountain, 1 mile from Careyville, and connects with Southern Railroad. The Block seam, having an average thickness of 42 inches, is worked. The roof is slate and shale and the bottom shale. It is developed on the Staggard double entry, room and pillar system. Ventilation is produced by fan, with a diameter of 12 feet, and is distributed by the return system. Haulage is conducted from rooms to sidetrack, a distance of 1,000 feet, by mules; from sidetrack to tippie, a distance of 2,000 feet, by rope, and from tippie to railroad cars, a distance of 4,000 feet, by 12-ton monitor cars.

CAMPBELL COUNTY.

Sunshine Mine—Owner, Operator and Inside Foreman, James McReynolds, Jellico.

This is a Class D drift mine, located 1,200 feet above sea level, in Indian Mountain, $1\frac{1}{4}$ miles from Jellico, and connects with Southern Railroad. The Blue Gem seam, having an average thickness of 24 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the single entry system. Ventilation is produced by natural conditions. Haulage is conducted from rooms to tippie, a distance of 300 feet, by mules.

CAMPBELL COUNTY.

Tennessee Blue Gem Mine—Operator, Tennessee Powder Co., Jellico; *Superintendent*, Charles Bradley, Jellico.

This is a Class D drift mine, operated under lease, and located 1,700 feet above sea level, in Indian Mountain, 1 mile from Jellico, and connects with L. & N. and Southern Railroads. The Blue Gem seam, having an average thickness of 24 inches, is worked. The roof is slate and the bottom slate and stone. It is developed on the single entry, room and pillar system. Ventilation is produced by natural conditions. Haulage is conducted from rooms to tippie, a distance of 400 feet, by mules.

CAMPBELL COUNTY.

Tennessee Jellico Mine—Owner and Operator, Tennessee Jellico Coal Co., Anthras; *President*, Robt. Wedekind, Louisville, Ky.; *Secretary*, W. G. Polk, Louisville, Ky.; *Inside Foreman*, W. M. Comer, Anthras.

This is a Class B drift mine, located 1,400 feet above sea level, in Cumberland Mountain, $\frac{1}{2}$ mile from Anthras, and connects with L. & N. and Southern Railroads. The Jellico seam, having an average thickness of 52 inches, is worked. The roof is slate and the bottom slate and stone. It is developed on the double entry, room and pillar system. Ventilation is produced by furnace, with a grate area of 60 feet, and is distributed as continuous current. Haulage is conducted from rooms to mine entrance, an average distance of 1,000 feet, by mules, and from mine entrance to tippie, a distance of 2,000 feet, by locomotive.

CAMPBELL COUNTY.

Westbourne Nos. 1-2 Mine—Owner and Operator, Westbourne Coal Co., Westbourne; President and Secretary, N. B. Perkins, Williamsburg, Ky.; Inside Foreman, Geo. Brown, Westbourne.

This is a Class C drift mine, operated under lease, located 1,100 feet above sea level, in Rich Mountain, at Westbourne, and connects with L. & N. Railroad. The Westbourne seam, having an average thickness of 42 inches, is worked. The roof is slate and the bottom fire clay and sandstone. It is developed on the single entry, room and pillar system. Ventilation is produced by electric fan, with a diameter of 12 feet, and is distributed by the split system. Haulage is conducted from all entries to knuckle, a distance of 3,000 feet, by motors, and from knuckle to railroad, a distance of 800 feet, by gravity incline.

CAMPBELL COUNTY.

Westbourne No. 3 Mine—Owner and Operator, Westbourne Coal Co., Westbourne; President and Secretary, N. B. Perkins, Williamsburg, Ky.; Inside Foreman, Geo. Brown, Westbourne.

This is a Class C drift mine, located 1,100 feet above sea level, in Rich Mountain, at Westbourne, and connects with L. & N. Railroad. The Westbourne seam, having an average thickness of 48 inches, is worked. The roof is sandstone and the bottom fire clay. It is developed on the single room system. Ventilation is produced by furnace, with a grate area of 20 feet, and is distributed by the split system. Haulage is conducted from face of entry to knuckle, a distance of 700 feet, by motors, and from knuckle to railroad, a distance of 800 feet, by gravity incline.

CAMPBELL COUNTY.

Whistle Creek Mine—Owner and Operator, Whistle Creek Coal Co., Newcomb; President, H. L. Brummett, Jellico.

This is a Class C drift mine, operated under lease, located 1,200 feet above sea level, in Jellico Mountain, 1 mile from Newcomb, and connects with Southern Railroad. The Jellico and Blue Gem seam, having an average thickness of 28 and 20 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the single entry system. Ventilation is produced by furnace, with a grate area of 25 feet, and is distributed as continuous current. Haulage is conducted from rooms to knuckle, a distance of 250 feet, by mules, and from knuckle to railroad, a distance of 800 feet, by incline.

CAMPBELL COUNTY.

Woodward No. 2 Mine—Owner, Operator, President and Inside Foreman, C. M. Woodward, Jellico.

This is a Class C drift mine, located 1,200 feet above sea level, in Jellico Mountain, $\frac{3}{4}$ mile from Jellico, and connects with L. & N. and Southern Railroads. The Blue Gem seam, having an average thickness of 24 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the single entry, room and pillar system. Ventilation is produced by furnace, with a grate area of 35 feet, and is distributed by the split system. Haulage is conducted from headings to tippie, a distance of 1,000 feet, by mules.

CAMPBELL COUNTY.

Wooldridge Mine—Owner and Operator, Wooldridge Jellico Coal Co., Wooldridge; President, P. Wooldridge, Pee wee Valley, Ky.; Inside Foreman, Thos. H. Griffith, Wooldridge.

This is a Class C drift mine, located 1,200 feet above sea level, in Jellico Mountain, $\frac{1}{2}$ mile from Wooldridge, and connects with Southern Railroad. The Jellico seam, having an average thickness of 38 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the single entry system. Ventilation is produced by fan, with a diameter of 8 feet, and is distributed as direct current. Haulage is conducted from rooms to knuckle, a distance of 900 feet, by mules, and from knuckle to railroad, a distance of 1,335 feet, by incline.

CAMPBELL COUNTY.

Zechini Mine—Owner, Italian Blue Gem Coal Co., Newcomb; Operator, Zechini Coal Co., Newcomb; President, Peter Zechini, Newcomb; Secretary, W. H. Jenkins, Newcomb; Inside Foreman, Joe Graef, Newcomb.

This is a Class B drift mine, located 1,275 feet above sea level, in Nigroun Mountain, 2 miles from Newcomb, and connects with Southern Railroad. The Jellico seam, having an average thickness of 34 inches, is worked. The roof is slate and sandstone and the bottom fire clay. It is developed on the single and double room system. Ventilation is produced by fan, with a diameter of 6 feet. Haulage is conducted from rooms to sidetrack, a distance of 650 feet, by mules, and from sidetrack to railroad, a distance of 3,000 feet, by mules. Length of incline 1,000 feet.

CLAIBORNE COUNTY.

Bryson Mountain No. 1 Mine—*Owner*, The American Association (Incorporated), Middlesboro, Ky.; *Operator*, Bryson Mountain Coal & Coke Co., Hartranft; *President*, Tim Cockill, Hartranft; *Inside Foreman*, A. L. Adam, Hartranft.

This is a Class C drift mine, located 1,755 feet above sea level, in Bryson Mountain, 1 mile from Hartranft, and connects with L. & N. and Southern Railroads. The Mingo seam, having an average thickness of 60 inches, is worked. The roof is slate and the bottom slate and clay. It is developed on the double entry system. Ventilation is produced by fan, with a diameter of 8 feet, and is distributed as continuous current. Haulage is conducted from rooms to sidetrack, a distance of 800 feet, by mules, and from sidetrack to chute at railroad tippie, a distance of 5,000 feet, by electric motors.

CLAIBORNE COUNTY.

Bryson Mountain No. 2 Mine—*Owner*, The American Association (Incorporated), Middlesboro, Ky.; *Operator*, Bryson Mountain Coal & Coke Co., Hartranft; *President*, Tim Cockill, Hartranft; *Inside Foreman*, A. L. Adam, Hartranft.

This is a Class C drift mine, located 2,255 feet above sea level, in Bryson Mountain, 1 mile from Hartranft, and connects with L. & N. and Southern Railroads. The Mingo seam, having an average thickness of 60 inches, is worked. The roof is slate and the bottom slate and clay. It is developed on the double entry system. Ventilation is produced by fan, with a diameter of 8 feet, and is distributed as continuous current. Haulage is conducted from rooms to tippie, a distance of 800 feet, by mules, and from tippie to chute at railroad, a distance of 800 feet, by endless rope.

CLAIBORNE COUNTY.

Buffalo Mine—*Owner and Operator*, Campbell Coal & Coke Co., Eagan; *President*, R. O. Campbell, Atlanta, Ga.; *Inside Foreman*, S. C. Wilson, Eagan.

This is a Class C drift mine, located 1,410 feet above sea level, at Eagan, and connects with L. & N. and Southern Railroads. The Buffalo seam, having an average thickness of 36 inches, is worked. The roof is sandstone and slate and the bottom sandstone. It is developed on the single entry, room and pillar system. Ventilation is produced by furnace for each entry, with a grate area of 50 feet, and is distributed as continuous circuit. Haulage is conducted from rooms to outside, through 5 butt entries and then along tram to head of incline, a distance of 982 feet, by electric motors, and from head of incline to railroad, a distance of 656 feet, by gravity.

CLAIBORNE COUNTY.

Fork Ridge No. 1 (or Fan Side) Mine—*Owner*, The American Association (Incorporated), Middlesboro, Ky.; *Operator*, Fork Ridge Coal & Coke Co., Fork Ridge; *President*, C. S. McManus, Knoxville; *Secretary*, B. T. Milam, Middlesboro, Ky.; *Inside Foreman*, John Lewis, Fork Ridge.

This is a Class C drift mine, located 1,700 feet above sea level, in Mingo Mountain, 34 mile from Fork Ridge, and connects with L. & N. and Southern Railroads. The Mingo seam, having an average thickness of 52 inches, is worked. The roof is slate and the bottom clay. It is developed on the double entry system. Ventilation is produced by fan, with a diameter of 14 feet, and is distributed by the split system. Haulage is conducted from rooms to general sidetrack, a distance of 800 feet, by mules, and from general sidetrack to tippie, a distance of 5,300 feet, by motors.

CLAIBORNE COUNTY.

Fork Ridge No. 2 (or Slope) Mine—*Owner*, The American Association (Incorporated), Middlesboro, Ky.; *Operator*, Fork Ridge Coal & Coke Co., Fork Ridge; *President*, C. S. McManus, Knoxville; *Secretary*, B. T. Milam, Middlesboro, Ky.; *Inside Foreman*, H. C. Farmer, Fork Ridge.

This is a Class C slope mine, with a pitch of 15 degrees, located 1,600 feet above sea level, in Mingo Mountain, $\frac{3}{4}$ mile from Fork Ridge, and connects with L. & N. and Southern Railroads. The Mingo seam, having an average thickness of 52 inches, is worked. The roof is slate and the bottom slate and clay. It is developed on the double entry system. Ventilation is produced by fan, with a diameter of 14 feet, and is distributed as continuous current. Haulage is conducted from rooms to sidetrack, a distance of 700 feet, by mules; from sidetrack to foot of slope, a distance of 5,200 feet, by motors, and from slope to tippie, a distance of 450 feet, by endless rope.

CLAIBORNE COUNTY.

Fork Ridge No. 3 Mine—*Owner*, The American Association (Incorporated), Middlesboro, Ky.; *Operator*, Fork Ridge Coal & Coke Co., Fork Ridge; *President*, C. S. McManus, Knoxville; *Secretary*, B. T. Milam, Middlesboro, Ky.; *Inside Foreman*, W. A. Owens and M. Woolum, Fork Ridge.

This is a Class C drift mine, located 2,500 feet above sea level, in Bryson Mountain, $1\frac{1}{2}$ miles from Fork Ridge, and connects with L. & N. and Southern Railroads. The Lower Hignite seam, having an average thickness of 48 inches, is worked. The roof is slate and sandstone and the bottom slate. It is developed on the double entry system. Ventilation is produced by fan, with a diameter of 10 feet. Haulage is conducted from rooms to mine entrance, a distance of 1,300 feet, by motors; from mine entrance to incline, a distance of 400 feet, by motors, and from incline to tippie, a distance of 2,200 feet, by gravity.

CLAIBORNE COUNTY.

King Mountain Mine—*Owner*, The American Association (Incorporated), Middlesboro, Ky.; *Operator*, King Mountain Coal Co., Clairfield; *President*, G. W. Easton, Middlesboro, Ky.; *Secretary*, G. W. Montgomery, Tazewell; *Inside Foreman*, Jas. Craig, Clairfield.

This is a Class C drift mine, located 1,100 feet above sea level, in King Mountain, $\frac{1}{4}$ mile from Clairfield, and connects with L. & N. and Southern Railroads. The Jellico seam, having an average thickness of 39 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the double entry system. Ventilation is produced by furnace, with a grate area of 49 feet, and is distributed by the split system. Haulage is conducted from rooms to sidetrack, a distance of 1,000 feet, by mules; from sidetrack to general sidetrack, a distance of 1,500 feet, by mules; from general sidetrack to drumhouse, a distance of 1,800 feet, by mules, and from drumhouse to railroad, a distance of 550 feet, by rope.

CLAIBORNE COUNTY.

Mingo No. 1 Mine—*Owner*, The American Association (Incorporated), Middlesboro, Ky.; *Operator*, Mingo Coal & Coke Co., Hartranft; *President*, R. L. Ralston, Hartranft; *Inside Foreman*, Bob Jones, Hartranft.

This is a Class C drift mine, located 1,600 feet above sea level, in Bryson Mountain, $\frac{1}{2}$ mile from Hartranft, and connects with L. & N. and Southern Railroads. The No. 1 seam, having an average thickness of 60 inches, is worked. The roof is sandstone and the bottom fire clay. It is developed on the single entry, room and pillar system. Ventilation is produced by furnace, with a grate area of — feet, and is distributed as continuous current. Haulage is conducted from rooms to mine entrance, a distance of — feet, by mules.

CLAIBORNE COUNTY.

Mingo No. 2 Mine—*Owner*, The American Association (Incorporated), Middlesboro, Ky.; *Operator*, Mingo Coal & Coke Co. (under contract with A. Davis), Hartranft; *President*, R. L. Ralston, Hartranft; *Inside Foreman*, Zack Ralston, Hartranft.

This is a Class C drift mine, located 1,600 feet above sea level, in Bryson Mountain, $\frac{1}{2}$ mile from Hartranft, and connects with L. & N. and Southern Railroads. The Mingo No. 1 seam, having an average thickness of 60 inches, is worked. The roof is sandstone and the bottom fire clay. It is developed on the single entry, room and pillar system. Ventilation is produced by fan, with a small diameter of — feet, and is distributed as continuous current. Haulage is conducted from rooms to mine entrance, a distance of — feet, by mules.

CLAIBORNE COUNTY.

Mingo No. 3 Mine—*Owner*, The American Association (Incorporated), Middlesboro, Ky.; *Operator*, Mingo Coal & Coke Co., Hartranft; *President*, R. L. Ralston, Hartranft; *Inside Foreman*, Bob Jones, Hartranft.

This is a Class C drift mine, located 2,250 feet above sea level, in Bryson Mountain, $\frac{1}{2}$ mile from Hartranft, and connects with L. & N. and Southern Railroads. The Mingo No. 2 seam, having an average thickness of 60 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the single entry, room and pillar system. Ventilation is produced by furnace, with a grate area of 20 feet, and is distributed as continuous current. Haulage is conducted from rooms to drum house, a distance of 900 feet, by mules; from drum house to foot of incline, a distance of 1,200 feet, by monitor cars, and from foot of incline to washer, a distance of 1,980 feet, by tram.

CLAIBORNE COUNTY.

Mingo No. 5 Mine—Owner, The American Association (Incorporated), Hartranft; *Operator*, Mingo Coal & Coke Co., Hartranft; *President*, R. L. Ralston, Hartranft; *Inside Foreman*, John Minton, Hartranft.

This is a Class C drift mine, located 2,280 feet above sea level, in Bryson Mountain, $\frac{1}{2}$ mile from Hartranft, and connects with L. & N. and Southern Railroads. The Poplar Lick seam, having an average thickness of 54 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the single entry, room and pillar system. Ventilation is produced by fan, with a diameter of 12 feet. Haulage is conducted from rooms to main entrance, a distance of 1,200 feet, by mules, and from main entrance to foot of incline, a distance of 1,900 feet, by gravity.

CLAIBORNE COUNTY.

New Jellico Mine—Owner, New Jellico Coal Co., Clairfield; *Operators*, Joe Vasey & Richard Rigby, Clairfield; *President*, Joe Vasey, Clairfield; *Secretary*, Richard Rigby, Clairfield; *Inside Foreman*, Walter Nunn, Clairfield.

This is a Class C drift mine, located 1,425 feet above sea level, in King Mountain, $\frac{1}{4}$ mile from Clairfield, and connects with L. & N. and Southern Railroads. The Jellico seam, having an average thickness of 33 inches, is worked. The roof is fire clay and the bottom sandstone. It is developed on the single entry, single and double room system. Ventilation is produced by furnace, with a grate area of 12 feet, and is distributed as continuous current. Haulage is conducted from all entries to tipple, an average distance of 800 feet, by mules, and from tipple to railroad, a distance of 700 feet, by incline.

CLAIBORNE COUNTY.

Nicholson No. 2 Mine—Owner, The American Association (Incorporated), Middlesboro, Ky.; *Operator*, Nicholson Coal Mining Co., Nicholson; *President*, J. C. Cardwell, Louisville, Ky.; *Secretary*, P. T. Colgan, Middlesboro, Ky.; *Inside Foreman*, J. A. Vowel, Nicholson.

This is a Class C drift mine, located 1,800 feet above sea level, in Mingo Mountain, $\frac{1}{4}$ mile from Nicholson, and connects with L. & N. and Southern Railroads. The Jack Rock seam, having an average thickness of 60 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the double entry system. Ventilation is produced by fan, with a diameter of 7 feet, and is distributed as continuous current. Haulage is conducted from rooms to sidetrack, a distance of 800 feet, by mules; from sidetrack to mine entrance, a distance of 700 feet, by locomotive; from mine entrance to knuckle, a distance of 1,200 feet, by locomotive, and from knuckle to railroad, a distance of 1,700 feet, by gravity incline.

CLAIBORNE COUNTY.

Nicholson No. 3 Mine—Owner, The American Association (Incorporated), Middlesboro, Ky.; *Operator*, Nicholson Coal Mining Co., Nicholson; *President*, J. C. Cardwell, Louisville, Ky.; *Secretary*, P. T. Colgan, Middlesboro, Ky.; *Inside Foreman*, George Maden, Nicholson.

This is a Class C drift mine, located 2,050 feet above sea level, in Mingo Mountain, $\frac{1}{4}$ mile from Nicholson, and connects with L. & N. and Southern Railroads. The Klondyke seam, having an average thickness of 60 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the double entry system. Ventilation is produced by fan, with a diameter of 7 feet, and is distributed as continuous current. Haulage is conducted from rooms to mine entrance, a distance of 2,000 feet, by mules; from mine entrance to knuckle, a distance of 500 feet, by locomotive, and from knuckle to railroad, a distance of 3,100 feet, by gravity incline.

CLAIBORNE COUNTY.

Pruden No. 1 Mine—Owner, The American Association (Incorporated), Middles-

boro, Ky.; *Operator*, Pruden Coal & Coke Co., Knoxville; *President*, Thomas Pruden, Knoxville; *Superintendent*, Wm. Buck, Pruden; *Inside Foreman*, Bob Brannam, Pruden.

This is a Class C drift mine, located 1,700 feet above sea level, in Bryson Mountain, at Pruden, and connects with L. & N. and Southern Railroads. The Mingo seam, having an average thickness of 72 inches, is worked. The roof and bottom are both slate. It is developed on the double entry, room and pillar system. Ventilation is produced by fan, with a diameter of 12 feet, and is distributed by the split system. Haulage is conducted from rooms to sidetrack, a distance of 1,000 feet, by mules; from sidetrack to tippie, a distance of 1,500 feet, by motors, and from tippie to railroad, a distance of 1,800 feet, by monitor cars.

CLAIBORNE COUNTY.

Pruden No. 2 Mine—*Owner*, The American Association (Incorporated), Middlesboro, Ky.; *Operator*, Pruden Coal & Coke Co., Knoxville; *President*, Thomas Pruden, Knoxville; *Superintendent*, Wm. Buck, Pruden; *Inside Foreman*, Bob Brannam, Pruden.

This is a Class C drift mine, located 1,700 feet above sea level, in Bryson Mountain, at Pruden, and connects with L. & N. and Southern Railroads. The Mingo seam, having an average thickness of 72 inches, is worked. The roof is slate and the bottom slate. It is developed on the room and pillar system. Ventilation is produced by fan, with a diameter of 12 feet, and is distributed by the split system. Haulage is conducted from rooms to sidetrack, a distance of 1,000 feet, by mules; from sidetrack to tippie, a distance of 4,500 feet, by motor, and from tippie to railroad chute, a distance of 1,800 feet, by monitor cars.

CLAIBORNE COUNTY.

Reliance No. 1-2 Mine—*Owner*, The American Association (Incorporated), Middlesboro, Ky.; *Operator*, Reliance Coal & Coke Co., Hartranft; *President*, George Walter Whiteman, Philadelphia, Pa.; *Secretary*, Allen Swab, Hartranft; *Inside Foreman*, Will Gent, Hartranft.

This is a Class C coal mine, located 1,600 feet above sea level, in Mullins Spur of Bryson Mountain, at Hartranft, and connects with L. & N. and Southern Railroads. The Middlesboro seam, having an average thickness of 60 inches, is worked. The roof and bottom are both slate. It is developed on the double entry system. Ventilation is produced by fan, with a diameter of 8 feet, and by furnace, with a grate area of 54 feet. Haulage for No. 1 is conducted from rooms to sidetrack, a distance of 500 feet, by mules; from sidetrack to tippie, a distance of 3,000 feet, by wire rope, and from tippie to railroad, a distance of 75 feet, by chute; and haulage for No. 2, from rooms to sidetrack, a distance of 700 feet, by mules, and from sidetrack to tippie, a distance of 5,000 feet, by tail rope.

CLAIBORNE COUNTY.

Reliance No. 3 Mine—*Owner*, The American Association (Incorporated), Middlesboro, Ky.; *Operator*, Reliance Coal & Coke Co., Hartranft; *President*, George Walter Whiteman, Philadelphia, Pa.; *Secretary*, Allen Swab, Hartranft.

This is a Class C drift mine, located 1,885 feet above sea level, in Mullins Spur of Bryson Mountain, at Hartranft, and connects with L. & N. and Southern Railroads. The sandstone parting seam, having an average thickness of 65 inches, is worked. The roof and bottom are both slate. Ventilation is produced by compressed air, with a compressor. Haulage is conducted from face of entry to outside, a distance of 600 feet, by mules; from drift mouth to tippie, a distance of 600 feet, by mules, and from tippie to railroad, a distance of 1,000 feet, by gravity plane. In the development of this mine, it is intended to drive 3,000 feet to the barriers, before driving any rooms, and to handle everything connected with the mine by electricity. The upper tippie has a capacity of 100 tons. The incline is double-tracked, and lands on a steel tippie, having a storage bin holding 100 tons, which is an innovation in the coal industry in Tennessee. All rails used are 40 pounds.

CLAIBORNE COUNTY.

Standard Mine—*Owner*, The American Association (Incorporated), Middlesboro, Ky.; *Operator*, Standard Coal & Coke Co., Clairfield; *President*, Charles F. Eager, Clairfield; *Secretary*, H. M. Axline, Middlesboro, Ky.; *Inside Foreman*, Jake Q. Angel, Clairfield.

This is a Class C drift mine, located 1,100 feet above sea level, in a spur of Log Mountain, 14 miles from Jellico, and connects with L. & N. and Southern Railroads. The Jellico seam, having an average thickness of 40 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the room and pillar system. Ventilation is produced by furnace, with a grate area of 48 feet, and is distributed as continuous current. Haulage is conducted from rooms to knuckle, a distance of 500 feet, by mules, and from knuckle to sidetrack, a distance of 850 feet, by gravity.

CLAIBORNE COUNTY.

Sterling No. 1-2 Mine—*Owner*, The American Association (Incorporated), Middlesboro, Ky.; *Operator*, Sterling Coal & Coke Co., Manring; *President*, C. S. McManus, Manring; *Secretary*, M. H. McCorkle, Manring; *Inside Foreman*, W. T. Robinson, Manring.

This is a Class C drift mine, located 2,300 feet above sea level, in Log Mountain, at Manring, and connects with Southern Railroad. The Sterling seam, having an average thickness of 60 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the double entry, room and pillar system. Ventilation is produced by fan, with a diameter of 8 feet, and is distributed by the split system. Haulage is conducted from face to sidetrack, a distance of 600 feet, by motors; from sidetrack to tippie, a distance of 5,500 feet, by motors, and from tippie to railroad, a distance of 800 feet, by monitor cars.

CLAIBORNE COUNTY.

Yellow Creek No. 2 Mine—*Owner*, The American Association (Incorporated), Middlesboro, Ky.; *Operator*, Yellow Creek Coal Co., Middlesboro, Ky.; *President*, John G. Fitzpatrick, Middlesboro, Ky.; *Secretary*, Joe F. Bosworth, Middlesboro, Ky.; *Inside Foreman*, M. Rockwell, Bosworth, Ky.

This is a Class C drift mine, located 2,425 feet above sea level, in Mingo Mountain, $\frac{1}{4}$ mile from Bosworth, Ky., and connects with L. & N. Railroad. The Poplar Lick seam, having an average thickness of 58 inches, is worked. The roof is shale and the bottom fire clay. It is developed on the single entry, room and pillar system. Ventilation is produced by fan, with a diameter of 7 feet, and is distributed by the split system. Haulage is conducted from heading to siding, a distance of 500 feet, by mules; from siding to tippie, a distance of 1,500 feet, by motors, and from tippie to railroad, a distance of 400 feet, by incline.

CLAIBORNE COUNTY.

Yellow Creek No. 3 Mine—*Owner*, The American Association (Incorporated), Middlesboro, Ky.; *Operator*, Yellow Creek Coal Co., Middlesboro, Ky.; *President*, John G. Fitzpatrick, Middlesboro, Ky.; *Secretary*, Joe F. Bosworth, Middlesboro, Ky.; *Inside Foreman*, D. B. Wallbright, Bosworth, Ky.

This is a Class C drift mine, located 2,275 feet above sea level, in Bennetts Fork of Mingo Mountain, $\frac{1}{4}$ mile from Bosworth, Ky., and connects with L. & N. and Southern Railroads. The Jack Rock seam, having an average thickness of 48 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the single entry system. Ventilation is produced by fan, with a diameter of 7 feet, and is distributed as continuous current. Haulage is conducted from rooms to sidetrack, a distance of 1,200 feet, by mules; from sidetrack to tippie, a distance of 1,000 feet, by motors, and from tippie to railroad, a distance of 1,700 feet, by incline.

CUMBERLAND COUNTY.

Clear Creek No. 1 Mine—*Owner and Operator*, Clear Creek Coal & Lumber Co., Isoline; *President*, J. E. Cummins, Columbus, O.; *Secretary*, D. W. Jones, Columbus, O.; *Inside Foreman*, S. L. Umbarger, Isoline.

This is a Class B drift mine, new opening, rock slope, located 1,900 feet above sea level, in Cumberland Mountain, at Isoline, and connects with Tennessee Central Railroad. The Isoline seam, having an average thickness of 44 inches, is worked. The roof is shale and the bottom shale and sandstone. It is developed on the entry and air course system, with rooms turned both sides of cross entries. Ventilation is produced by fan, with a diameter of 15 feet, and is distributed by the split system. Haulage is conducted from rooms to foot of slope, a distance of 1,500 feet, by mules, and from foot of slope to tippie, a distance of 400 feet, by rope.

CUMBERLAND COUNTY.

Clear Creek No. 5 Mine—*Owner and Operator*, Clear Creek Coal & Lumber Co., Iso-

line; *President*, J. E. Cummins, Columbus, Ohio; *Secretary*, D. W. Jones, Isoline; *Inside Foreman*, S. L. Umbarger, Isoline.

This is a Class B slope mine, located 1,900 feet above sea level, in Cumberland Mountain, at Isoline, and connects with Tennessee Central Railroad. The Isoline seam, having an average thickness of 44 inches, is worked. The roof is shale and the bottom shale and sandstone. It is developed on the entry and air course system, with rooms turned both sides cross entries. Ventilation is produced by fan, with a diameter of 15 feet, and is distributed by the split system. Haulage is conducted from rooms to foot of slope, a distance of 800 feet, by mules, and from foot of slope to tipple, a distance of 400 feet, by rope haulage.

CUMBERLAND COUNTY.

Fall Creek Mine—Owner and Operator, Fall Creek Collieries, Ozone; *President*, N. C. Chapman, St. Louis, Mo.; *Secretary*, A. M. Stewart, Ozone.

This is a Class C drift mine, located 2,000 feet above sea level, in Cumberland Mountain, $2\frac{1}{2}$ miles from Ozone, and connects with Tennessee Central Railroad. The Big Sewanee seam, having an average thickness of 60 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the double entry, room and pillar system. Ventilation is produced by furnace, with a grate area of 40 feet. Haulage is conducted from rooms to tipple, a distance of — feet, by mules.

CUMBERLAND COUNTY.

Renfro Mine—Owner, H. A. Butler, Mauch Chunk, Pa.; *Operator*, Renfro Coal & Coke Co., Renfro; *President*, H. A. Butler, Mauch Chunk, Pa.; *Secretary*, H. L. Pabst, Mauch Chunk, Pa.

This is a Class C drift and slope mine, located 1,800 feet above sea level, in Cumberland Mountain, 3 miles from Crab Orchard, and connects with Tennessee Central Railroad. The Sewanee seam, having an average thickness of 42 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the room and pillar system. Ventilation is produced by fan, with a diameter of 10 feet. Haulage is conducted from rooms to slope, a distance of 600 feet, by mules; from slope to tipple, a distance of 800 feet, by cable, and from tipple to railroad, a distance of 300 feet, by incline.

CUMBERLAND COUNTY.

Waldensia Mine—Owner, Chicago-Tenn. Coal & Coke Co., Chicago, Ill.; *Operator*, Waldensia Coal & Coke Co., Waldensia; *President*, R. Ellison, Cincinnati, O.; *Secretary*, R. A. Cotter, Cincinnati, O.; *Inside Foreman*, D. P. Taylor, Waldensia.

This is a Class B slope mine, located 1,900 feet above sea level, in Cumberland Mountain, 3 miles from Waldensia, and connects with Tennessee Central Railroad. The Big Sewanee seam, having an average thickness of 72 inches, is worked. The roof is slate and the bottom sandrock. It is developed on the entry and air course system. Ventilation is produced by furnace, with a grate area of 36 feet. Haulage is conducted from rooms to slope, a distance of 800 feet, by mules, and from slope to tipple, a distance of 2,500 feet, by drop rope.

FENTRESS COUNTY.

Fentress No. 1 Mine—Owner and Operator, Fentress Coal & Coke Co., Wilder; *President*, Chas. H. Treat, New York City; *Secretary*, J. G. Taylor, Philadelphia, Pa.; *Inside Foreman*, Geo. L. Bell, Wilder.

This is a Class C drift mine, located 1,600 feet above sea level, in Cumberland Mountain, at Wilder, and connects with Tennessee Central Railroad. The No. 2 Bon Air seam, having an average thickness of 48 inches, is worked. The roof is slate and the bottom sandstone. It is developed on the double entry, room and pillar system. Ventilation is produced by fan, with a diameter of 7 feet, and is distributed by the split system. Haulage is conducted from face of entry to tipple, a distance of 6,500 feet, by electric motors.

FENTRESS COUNTY.

Fentress No. 2 Mine—Owner and Operator, Fentress Coal & Coke Co., Wilder; *President*, Chas. H. Treat, Washington, D. C.; *Secretary*, G. H. Taylor, Philadelphia, Pa.; *Inside Foreman*, Geo. L. Bell, Wilder.

This is a Class C drift mine, located 1,600 feet above sea level, in Cumberland Mountain, at Wilder, and connects with Tennessee Central Railroad. The No. 2 Bon

Air seam, having an average thickness of 48 inches, is worked. The roof is slate and the bottom sandstone. It is developed on the single entry system. Ventilation is produced by fan, with a diameter of 10 feet, and is distributed as continuous current. Haulage is conducted from rooms to sidetrack, a distance of 300 feet, by mules, and from sidetrack to tippie, a distance of 2,000 feet, by motors.

GRUNDY COUNTY.

Brushy Ridge Mine—Owner and Operator, Nunley Ridge Coal Co., Tracy City; President, E. L. Hampton, Tracy City; Secretary, G. M. Thorogood, Tracy City; Inside Foreman, J. C. Roberts, Tracy City.

This is a Class D drift mine, located 1,910 feet above sea level, in Cumberland Mountain, 3 miles from Tracy City, and connects with N., C. & St. L. Railway. The Sewanee seam, having an average thickness of 42 inches, is worked. The roof is slate and sandrock and the bottom fire clay. It is developed on the room and pillar system. Ventilation is produced by natural conditions. Haulage is conducted from main heading to tippie, a distance of 400 feet, by mules.

GRUNDY COUNTY.

Chattanooga K Mine—Owner, J. B. Ferguson, Coalmont; Operator, Chattanooga Mining Co., Chattanooga; President, W. E. Kunz, Chattanooga; Inside Foreman, J. R. Ryan, Coalmont.

This is a Class C drift mine, located 1,800 feet above sea level, in Cumberland Mountain, ½ mile from Coalmont, and connects with N., C. & St. L. Railway. The Sewanee seam, having an average thickness of 30 inches, is worked. The roof is slate and the bottom slate and clay. It is developed on the single entry system. Ventilation is produced by furnace, with a grate area of 100 feet. Haulage is conducted from head of entry to tippie, a distance of 2,000 feet, by mules.

GRUNDY COUNTY.

Clouse Hill Mine—Owner and Operator, Sewanee Fuel & Iron Co., Coalmont; President, F. B. Martin, Chattanooga; Secretary, E. Martin, Chattanooga; Inside Foreman, J. M. Seahorn, Coalmont.

This is a Class C drift mine, located 1,950 feet above sea level, in Cumberland Mountain, 4 miles from Tracy City, and connects with N., C. & St. L. Railway. The Sewanee seam, having an average thickness of 30 inches, is worked. The roof is slate and the bottom clay and slate. It is developed on the single entry and air course system. Ventilation is produced by natural conditions. Haulage is conducted from heading to tippie, a distance of 4,000 feet, by mules.

GRUNDY COUNTY.

Coalmont A Mine—Owner and Operator, Sewanee Fuel & Iron Co., Coalmont; President, F. B. Martin, Chattanooga; Secretary, E. Martin, Chattanooga; Inside Foreman, J. M. Seahorn, Coalmont.

This is a Class C drift mine, located 1,916 feet above sea level, in Cumberland Mountain, ½ mile from Coalmont, and connects with N., C. & St. L. Railway. The Sewanee seam, having an average thickness of 30 inches, is worked. The roof is slate and the bottom slate and clay. It is developed on the single entry and air course system. Ventilation is produced by furnace, with a grate area of 48 feet. Haulage is conducted from rooms to tippie, a distance of 2,500 feet, by mules.

GRUNDY COUNTY.

Coalmont B Mine—Owner and Operator, Sewanee Fuel & Iron Co., Coalmont; President, F. B. Martin, Chattanooga; Secretary, E. Martin, Chattanooga; Inside Foreman, J. M. Seahorn, Coalmont.

This is a Class C drift mine, located 1,904 feet above sea level, in Cumberland Mountain, ½ mile from Coalmont, and connects with N., C. & St. L. Railway. The Sewanee seam, having an average thickness of 36 inches, is worked. The roof is slate and the bottom slate and clay. It is developed on the single entry and air course system. Ventilation is produced by furnace, with a grate area of 60 feet. Haulage is conducted from rooms to north second sidetrack, a distance of 2,415 feet, by mules; from second south sidetrack to first sidetrack, a distance of 600 feet, by mules, and from first sidetrack to tippie, a distance of 1,485 feet, by mules.

GRUNDY COUNTY.

Coalmont H Mine—Owner and Operator, Sewanee Fuel & Iron Co., Coalmont;

President, F. B. Martin, Chattanooga; Secretary, E. Martin, Chattanooga; Inside Foreman, J. M. Seahorn, Coalmont.

This is a Class C drift mine, located 1,923 feet above sea level, in Cumberland Mountain, $\frac{1}{2}$ mile from Coalmont, and connects with N., C. & St. L. Railway. The Sewanee seam, having an average thickness of 32 inches, is worked. The roof is slate and the bottom slate and clay. It is developed on the single entry and air course system. Ventilation is produced by furnace, with a grate area of 48 feet. Haulage is conducted from rooms to sidetrack, a distance of 1,550 feet, by mules, and from sidetrack to tipple, a distance of 1,600 feet, by mules.

GRUNDY COUNTY.

Coalmont O Mine—Owner and Operator, Sewanee Fuel & Iron Co., Coalmont; President, F. B. Martin, Chattanooga; Secretary, E. Martin, Chattanooga; Inside Foreman, J. M. Seahorn, Coalmont.

This is a Class C drift mine, located 1,907 feet above sea level, in Cumberland Mountain, $\frac{1}{2}$ mile from Coalmont, and connects with N., C. & St. L. Railway. The Sewanee seam, having an average thickness of 30 inches, is worked. The roof is slate and the bottom slate and clay. It is developed on the single entry and air course system. Ventilation is produced by furnace, with a grate area of 48 feet. Haulage is conducted from rooms to second sidetrack, a distance of 1,000 feet, by mules; from second sidetrack to first sidetrack, a distance of 700 feet, by mules, and from first sidetrack to tipple, a distance of 400 feet, by mules.

GRUNDY COUNTY.

Coalmont Q Mine—Owner and Operator, Sewanee Fuel & Iron Co., Coalmont; President, F. B. Martin, Chattanooga; Secretary, E. Martin, Chattanooga; Inside Foreman, James Lockhart, Coalmont.

This is a Class C drift mine, located 1,911 feet above sea level, in Cumberland Mountain, $\frac{1}{2}$ mile from Coalmont, and connects with N., C. & St. L. Railway. The Sewanee seam, having an average thickness of 36 inches, is worked. The roof is slate and the bottom slate and clay. It is developed on the single entry and air course system. Ventilation is produced by furnace, with a grate area of 48 feet. Haulage is conducted from rooms to tipple, a distance of 1,600 feet, by mules.

GRUNDY COUNTY.

East Fork Mine—Owner and Operator, Tennessee Consolidated Coal Co., Tracy City; President, E. L. Hampton, Tracy City; Secretary, R. B. Roberts, Tracy City; Inside Foreman, W. C. Parsons, Tracy City.

This is a Class D drift mine, located 1,900 feet above sea level, in Cumberland Mountain, 1 mile from Tracy City, and connects with N., C. & St. L. Railway. The Sewanee seam, having an average thickness of 42 inches, is worked. The roof is slate and sandrock and the bottom fire clay. It is developed on the room and pillar system. Ventilation is produced by natural conditions. Haulage is conducted from rooms to main sidetrack, a distance of 1,200 feet, by mules, and from main sidetrack to tipple, a distance of 1,000 feet, by mules.

GRUNDY COUNTY.

East Staub Mine—Owner and Operator, Tennessee Consolidated Coal Co., Tracy City; President, E. L. Hampton, Tracy City; Secretary, G. M. Thorogood, Tracy City; Inside Foreman, J. C. Roberts, Tracy City.

This is a Class C drift mine, located 1,900 feet above sea level, in Cumberland Mountain, 3 miles from Tracy City, and connects with N., C. & St. L. Railway. The Sewanee seam, having an average thickness of 42 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the single entry, room and pillar system. Ventilation is produced by natural conditions. Haulage is conducted from rooms to tipple, an average distance of 2,000 feet, by mules.

GRUNDY COUNTY.

Flat Branch Mine—Owner and Operator, The Flat Branch Coal Co., Meeks; President, Dr. D. H. Thomas, Columbus, O.; Secretary, W. H. Workman, Meeks; Inside Foreman, W. S. Orange, Meeks.

This is a Class C drift mine, located 1,900 feet above sea level, in Cumberland Mountain, 1 mile from Meeks, and connects with N., C. & St. L. Railway. The

Sewanee seam, having an average thickness of 32 inches, is worked. The roof is slate and the bottom slate and clay. It is developed on the single entry system. Ventilation is produced by furnace, with a grate area of 30 feet, and is distributed by the split system. Haulage is conducted from rooms to tippie, a distance of 2,700 feet,

GRUNDY COUNTY.

Ramsey No. 1 Mine—Owner and Operator, Tennessee Consolidated Coal Co., Tracy City; President, E. L. Hampton, Tracy City; Secretary, G. M. Thorogood, Tracy City; Inside Foreman, S. L. Lowry, Tracy City.

This is a Class C drift mine, located 1,860 feet above sea level, in Cumberland Mountain, 3 miles from Tracy City, and connects with N., C. & St. L. Railway. The Sewanee seam, having an average thickness of 42 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the single entry, room and pillar system. Ventilation is produced by natural conditions. Haulage is conducted from rooms to tippie, an average distance of 3,550 feet, by mules.

GRUNDY COUNTY.

Ramsey (West) Mine—Owner and Operator, Tennessee Consolidated Coal Co., Tracy City; President, E. L. Hampton, Tracy City; Secretary, G. M. Thorogood, Tracy City; Inside Foreman, S. L. Lowry, Tracy City.

This is a Class D drift mine, located 1,875 feet above sea level, in Cumberland Mountain, 3 miles from Tracy City, and connects with N., C. & St. L. Railway. The Sewanee seam, having an average thickness of 42 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the room and pillar system. Ventilation is produced by natural conditions. Haulage is conducted from rooms to tippie, an average distance of 700 feet, by mules. All rob work.

GRUNDY COUNTY.

Reid Hill No. 1 Mine—Owner and Operator, Tennessee Consolidated Coal Co., Tracy City; President, E. L. Hampton, Tracy City; Secretary, G. M. Thorogood, Tracy City; Inside Foreman, S. L. Lowry, Tracy City.

This is a Class C drift mine, located 1,919 feet above sea level, in Cumberland Mountain, 1 mile from Tracy City, and connects with N., C. & St. L. Railway. The Sewanee seam, having an average thickness of 42 inches, is worked. The roof is slate and the bottom slate and fire clay. It is developed on the room and pillar system. Ventilation is produced by furnace, with a grate area of 96 feet, and is distributed by the split system. Haulage is conducted from rooms to sidetrack, an average distance of 995 feet, by mules, and from sidetrack to tippie, a distance of 1800 feet, by mules.

GRUNDY COUNTY.

Roddy Springs No. 1 Mine—Owner and Operator, Nunley Ridge Coal Co., Tracy City; President, E. L. Hampton, Tracy City; Secretary, G. M. Thorogood, Tracy City; Inside Foreman, Taylor Shadrick (contractor), Tracy City.

This is a Class C drift mine, located 1,900 feet above sea level, in Cumberland Mountain, 5 miles from Tracy City, and connects with N., C. & St. L. Railway. The Sewanee seam, having an average thickness of 42 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the room and pillar system. Ventilation is produced by natural conditions. Haulage is conducted from rooms to main heading, a distance of 400 feet, by mules, and from main heading to tippie, a distance of 650 feet, by mules.

GRUNDY COUNTY.

Street Hill Mine—Owner and Operator, Tennessee Consolidated Coal Co., Tracy City; President, E. L. Hampton, Tracy City; Secretary, G. M. Thorogood, Tracy City; Inside Foreman, Dan Moran, Tracy City.

This is a Class D drift mine, located 1,890 feet above sea level, in Cumberland Mountain, 1 mile from Tracy City, and connects with N., C. & St. L. Railway. The Sewanee seam, having an average thickness of 42 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the room and pillar system. Ventilation is produced by natural conditions. Haulage is conducted from rooms to tippie, an average distance of 1,760 feet, by mules.

HAMILTON COUNTY.

Big Soddy No. 1 Mine—Operator, New Soddy Coal Co., Chattanooga; President, D.

P. Montague, Chattanooga; *Secretary*, D. H. Rains, Chattanooga; *Inside Foreman*, J. B. Mansfield, Soddy.

This is a Class C drift mine, operated under lease, located 1,250 feet above sea level, in Waldens Ridge, $2\frac{1}{2}$ miles from Soddy, and connects with C., N. O. & T. P. Ry. Co. The No. 9 seam, having an average thickness of 30 inches, is worked. The roof is slate and the bottom sandstone. It is developed on the double entry, room and pillar system. Ventilation is produced by furnace, with a grate area of 30 feet, and is distributed as continuous current. Haulage is conducted from rooms to mine entrance, a distance of 1,600 feet, by mules; from mine entrance to incline, a distance of 700 feet, by mules, and from incline to tippie, a distance of 850 feet, by rope.

HAMILTON COUNTY.

Big Soddy No. 2 Mine—*Operator*, New Soddy Coal Co., Chattanooga; *President*, D. P. Montague, Chattanooga; *Secretary*, D. H. Rains, Chattanooga; *Inside Foreman*, J. B. Mansfield, Soddy.

This is a Class C drift mine, operated under lease, and located 1,250 feet above sea level, in Waldens Ridge, $2\frac{1}{2}$ miles from Soddy, and connects with C., N. O. & T. P. Ry. Co. The No. 9 seam, having an average thickness of 30 inches, is worked. The roof is slate and the bottom sandstone. It is developed on the double entry, room and pillar system. Ventilation is produced by furnace, with a grate area of 25 feet, and is distributed as continuous current. Haulage is conducted from rooms to mine entrance, a distance of 1,000 feet, by mules; from mine entrance to incline, a distance of 100 feet, by mules, and from incline to tippie, a distance of 850 feet, by rope.

HAMILTON COUNTY.

Big Soddy No. 3 Mine—*Operator*, New Soddy Coal Co., Chattanooga; *President*, D. P. Montague, Chattanooga; *Secretary*, D. H. Rains, Chattanooga; *Inside Foreman*, J. B. Mansfield, Soddy.

This is a Class C drift mine, operated under lease, located 1,250 feet above sea level, in Waldens Ridge, $2\frac{1}{2}$ miles from Soddy, and connects with C., N. O. & T. P. Ry. Co. The No. 9 seam, having an average thickness of 30 inches, is worked. The roof is slate and the bottom sandstone. It is developed on the double entry, room and pillar system. Ventilation is produced by furnace, with a grate area of 25 feet, and is distributed as continuous current. Haulage is conducted from rooms to mine entrance, a distance of 850 feet, by mules; from mine entrance to incline, a distance of 500 feet, by mules, and from incline to tippie, a distance of 850 feet, by rope.

HAMILTON COUNTY.

Big Soddy No. 4 Mine—*Operator*, New Soddy Coal Co., Chattanooga; *President*, D. P. Montague, Chattanooga; *Secretary*, D. H. Rains, Chattanooga; *Inside Foreman*, J. B. Mansfield, Soddy.

This is a Class C drift mine, operated under lease, located 1,250 feet above sea level, in Waldens Ridge, $2\frac{1}{2}$ miles from Soddy, and connects with C., N. O. & T. P. Ry. Co. The No. 9 seam, having an average thickness of 30 inches, is worked. The roof is slate and the bottom sandstone. It is developed on the double entry, room and pillar system. Ventilation is produced by furnace, with a grate area of 25 feet, and is distributed as continuous current. Haulage is conducted from rooms to mine entrance, a distance of 800 feet, by mules; from mine entrance to incline, a distance of 1,500 feet, by mules, and from incline to tippie, a distance of 850 feet, by rope.

HAMILTON COUNTY.

Big Soddy A Mine—*Operator*, New Soddy Coal Co., Chattanooga; *President*, D. P. Montague, Chattanooga; *Secretary*, D. H. Rains, Chattanooga; *Inside Foreman*, J. B. Mansfield, Soddy.

This is a Class C drift mine, operated under lease, located 1,286 feet above sea level, in Waldens Ridge, $2\frac{1}{2}$ miles from Soddy, and connects with C., N. O. & T. P. Ry. Co. The No. 10 seam, having an average thickness of 30 inches, is worked. The roof is slate and the bottom sandstone. It is developed on the double entry, room and pillar system. Ventilation is produced by furnace, with a grate area of 30 feet, and is distributed as continuous current. Haulage is conducted from rooms to mine entrance, a distance of 800 feet, by mules; from mine entrance to incline, a distance of 1,500 feet, by mules, and from incline to tippie, a distance of 850 feet, by rope.

HAMILTON COUNTY.

Big Soddy B Mine—*Operator*, New Soddy Coal Co., Chattanooga; *President*, D. P.

Montague, Chattanooga; *Secretary*, D. H. Rains, Chattanooga; *Inside Foreman*, J. B. Mansfield, Soddy.

This is a Class C drift mine, operated under lease, located 1,286 feet above sea level, in Waldens Ridge, $2\frac{1}{2}$ miles from Soddy, and connects with C. N. O. & T. P. Ry. Co. The No. 10 seam, having an average thickness of 30 inches, is worked. The roof is slate and the bottom sandstone. It is developed on the double entry, room and pillar system. Ventilation is produced by furnace, with a grate area of 25 feet, and is distributed as continuous current. Haulage is conducted from rooms to mine entrance, a distance of 1,000 feet, by mules; from mine entrance to incline, a distance of 400 feet, by mules, and from incline to tippie, a distance of 850 feet, by rope.

HAMILTON COUNTY.

Lewis Mine—Owner, Chattanooga Co. (Limited), Chattanooga; *Operator*, Lewis & Smith, Soddy, R. F. D. No. 2; *President*, J. S. Lewis, Soddy, R. F. D. No. 2; *Inside Foreman*, A. N. Smith, Soddy, R. F. D. No. 2.

This is a Class C drift mine, located 1,650 feet above sea level, in Waldens Ridge, 3 miles from Daisy. The Soddy No. 10 seam, having an average thickness of 42 inches is worked. The roof is slate and the bottom clay. It is developed on the single entry system. Ventilation is produced by furnace, with a grate area of 36 feet. Haulage is conducted from rooms to mine entrance, a distance of 600 feet, by mules; and from outside to Daisy, a distance of 3 miles, by wagons and sold to local trade.

HAMILTON COUNTY.

Montlake Mine—Owner and Operator, Montlake Coal Co., Chattanooga; *President*, G. T. Meehan, Chattanooga; *Secretary*, P. A. Brawner, Chattanooga; *Inside Foreman*, C. N. Ledford, Montlake.

This is a Class C drift mine, located 1,650 feet above sea level, in Waldens Ridge, at Montlake, and connects with C. N. O. & T. P. Ry. Co. The No. 10 seam, having an average thickness of 36 inches, is worked. The roof is slate and the bottom slate and clay. It is developed on the double entry, single and double room and pillar system. Ventilation is produced by fan with a diameter of 7 feet, and by furnace, with a grate area of 25 feet, and by natural conditions, and is distributed as continuous current. Haulage is conducted from rooms to hallway, a distance of 1,300 feet, by mules; from hallway to tip house, a distance of 3,000 feet, by tail rope; from tip house to bottom of tippie, a distance of 2,100 feet, by drum; from bottom of tippie to railroad, a distance of 9,100 feet, by company railroad.

HAMILTON COUNTY.

New Soddy 1-2 Mine—Operator, New Soddy Coal Co., Chattanooga; *President*, P. D. Montague, Chattanooga; *Secretary*, B. H. Rains, Chattanooga; *Inside Foreman*, J. T. Olinger, Soddy.

This is a Class C drift mine, operated under lease, located 1,268 feet above sea level, in Waldens Ridge, $1\frac{1}{4}$ miles from Soddy, and connects with C. N. O. & T. P. Ry. Co. The No. 7 seam, having an average thickness of 27 inches, is worked. The roof and bottom are both sandstone. It is developed on the double entry, double room system. Ventilation is produced by 4 fans, with a diameter of 4 feet each, and is distributed as continuous current. Haulage is conducted from rooms to first sidetrack, a distance of 1,800 feet, by mules; from first sidetrack to second sidetrack, a distance of 5,000 feet, by rope; from second sidetrack to general sidetrack, a distance of 5,000 feet, by motor; and from general siding to tippie, a distance of 7,200 feet, by rope.

HAMILTON COUNTY.

New Soddy No. 4 Mine—Operator, New Soddy Coal Co., Chattanooga; *President*, D. P. Montague, Chattanooga; *Secretary*, D. H. Rains, Chattanooga; *Inside Foreman*, M. L. Jenkins, Soddy.

This is a Class C drift mine, operated under lease, located 1,340 feet above sea level, in Walden's Ridge, 1 mile from Soddy, and connects with C. N. O. & T. P. Ry. Co. The No. 7 seam, having an average thickness of 34 inches, is worked. The roof is slate and the bottom sandstone. It is developed on the room and pillar system. Ventilation is produced by furnace with a grate area of 25 feet, and is distributed as continuous current. Haulage is conducted from rooms to mine entrance, a distance of 300 feet, by mules; from mine entrance to incline, a distance of 2,700 feet, by mules; from top incline to bottom of incline, a distance of 800 feet, by rope; and from bottom of incline to tippie, a distance of 3,200 feet, by rope.

HAMILTON COUNTY.

New Soddy No. 5 Mine—Operator, New Soddy Coal Co., Chattanooga; President, D. P. Montague, Chattanooga; Secretary, D. H. Rains, Chattanooga; Inside Foreman, J. T. Olinger, Soddy.

This is a Class C drift mine, located 1,388 feet above sea level, in Waldens Ridge, 1½ miles from Soddy, and connects with C. N. O. & T. P. Ry. Co. The No. 10 seam, having an average thickness of 28 inches, is worked. The roof is slate and the bottom sandy shale. It is developed on the room and pillar system. Ventilation is produced by furnace with a grate area of 30 feet, and is distributed by the split system. Haulage is conducted from rooms to mine entrance, a distance of 1,600 feet, by mules; from mine entrance to general sidetrack, a distance of 1,500 feet, by rope; and from sidetrack to tippie, a distance of 7,200 feet, by rope.

HAMILTON COUNTY.

New Soddy No. 9 Mine—Operator, New Soddy Coal Co., Chattanooga; President, Montague, Chattanooga; Secretary, D. H. Rains, Chattanooga; Inside Foreman, J. T. Olinger, Soddy.

This is a Class C drift mine, operated under lease, located 1,350 feet above sea level, in Waldens Ridge, 1½ miles from Soddy, and connects with C. N. O. & T. P. Ry. Co. The No. 9 seam, having an average thickness of 30 inches, is worked. The roof is slate and the bottom sandstone. It is developed on the room and pillar system. Ventilation is produced by furnace with a grate area of 25 feet, and is distributed as continuous current. Haulage is conducted from rooms to pit mouth, a distance of 700 feet, by mules; from pit mouth to incline, a distance of 400 feet, by mules; from incline to sidetrack, a distance of 1,100 feet, by rope; and from sidetrack to tippie, a distance of 7,200 feet, by rope.

HAMILTON COUNTY.

New Soddy No. 10 Mine—Operator, New Soddy Coal Co., Chattanooga; President, D. P. Montague, Chattanooga; Secretary, D. H. Rains, Chattanooga; Inside Foreman, J. T. Olinger, Soddy.

This is a Class C drift mine, operated under lease, located 1,380 feet above sea level, in Waldens Ridge, 1½ miles from Soddy, and connects with C. N. O. & T. P. Ry. Co. The No. 10 seam, having an average thickness of 28 inches, is worked. The roof is slate and the bottom sandstone. It is developed on the room and pillar system. Ventilation is produced by furnace, with a grate area of 20 feet, and is distributed as continuous current. Haulage is conducted from rooms to first incline, a distance of 1,100 feet, by mules; from first incline to second incline, a distance of 700 feet, by mules; from top of incline to bottom of incline, a distance of 1,000 feet, by rope; and from bottom of incline to tippie, a distance of 3,900 feet, by rope.

HAMILTON COUNTY.

Sale Creek Mine—Operator, Sale Creek Coal & Coke Co., Chattanooga; President, H. S. Chamberlain, Chattanooga; Secretary, D. H. Rains, Chattanooga; Inside Foreman, Dan C. Parry, Chattanooga.

This is a Class C drift mine, operated under lease, located 875 feet above sea level, in Waldens Ridge, 1 mile from Sale Creek, and connects with C. N. O. & T. P. Ry. Co. The No. 2 seam, having an average thickness of 42 inches, is worked. The roof is slate and the bottom sandstone. It is developed on the double entry, room and pillar system. Ventilation is produced by fan with a diameter of 10 feet, and is distributed by the split system. Haulage is conducted from room to sidetrack, a distance of 1,800 feet, by mules; and from sidetrack to tippie, a distance of 3,600 feet, by rope.

MARION COUNTY.

Battle Creek No. 1 Mine—Owner and Operator, Battle Creek Coal & Coke Co., Orme; President, Roby Robinson, Atlanta, Ga.; Secretary, V.-P. and Gen. Mgr., F. P. Thompson, Orme; Inside Foreman, William McIntyre, Sr., Orme.

This is a Class C drift mine, located 1,550 feet above sea level, in Cumberland Mountain, 1 mile from Orme, and connects with N. C. & St. L. Ry. The Battle Creek seam, having an average thickness of 5 feet, is worked. The roof is sandstone and slate and the bottom sandstone. It is developed on the double entry system. Ventilation is produced by fan with a diameter of 7 feet, and is distributed by the split system. Haulage is conducted from mine to chute, a distance of 3,700 feet, by locomotive; and from chute to railroad, a distance of 3,300 feet, by incline.

MARION COUNTY.

New Etna No. 1 Mine—Owner and Operator, New Etna Coal Co., Chattanooga; President, S. W. Hassell, New York City; Secretary, Frank H. Moffett, Whiteside; Superintendent, Thomas Degnan, Whiteside; Inside Foreman, A. G. Stansberry, Whiteside.

This is a Class B slope mine, located 1,480 feet above sea level, in Cumberland Mountain, 2 miles from Whiteside, and connects with N. C. & St. L. Ry. The Kelly seam, having an average thickness of 32 inches, is worked. The roof is slate and the bottom sandstone. It is developed on the single entry, room and pillar system. Ventilation is produced by fan with a diameter of 16 feet, and is distributed as continuous current. Haulage is conducted from rooms to outside, a distance of 3,000 feet, by mules; from outside to drum, a distance of 23,760 feet, by locomotive; from drum to foot of incline, a distance of 4,200 feet, by gravity; and from foot of incline to railroad tipple, a distance of 3,800 feet, by locomotive.

MARION COUNTY.

New Etna No. 2 Mine—Owner, New Etna Coal Co., Chattanooga; Operator, New Etna Coal Co., under contract with C. A. Hall & Co., Whiteside; President, H. W. Hassell, New York City; Superintendent, C. A. Hall, Whiteside; Inside Foreman, A. G. Stansberry, Whiteside.

This is a class D drift mine, located 1,480 feet above sea level, in Cumberland Mountain, 2 miles from Whiteside, and connects with N. C. & St. L. Ry. The Kelly seam, having an average thickness of 32 inches, is worked. The roof is slate and the bottom sandstone. It is developed on the single entry, room and pillar system. Ventilation is produced by furnace with a grate area of —feet, and is distributed as continuous current. Haulage is conducted from rooms to outside, a distance of 600 feet, by mules; from outside to tipple, a distance of 150 feet, by mules; from tipple to drum, a distance of 6,000 feet, by locomotive; from drum to foot of incline, a distance of 4,200 feet, by gravity; and from foot of incline to railroad tipple, a distance of 3,800 feet, by locomotive.

MARION COUNTY.

New Etna No. 3 Mine—Owner, New Etna Coal Co., Chattanooga; Operator, New Etna Coal Co., under contract with Joe Higdon, Roope; President, S. W. Hassell, New York City; Superintendent, Thomas Degnan, Whiteside; Inside Foreman, Mac Higdon, Roope.

This is a Class D slope mine, located 1,480 feet above sea level, in Cumberland Mountain, 2 miles from Roope, and connects with N. C. & S. L. Ry. The Kelly seam, having an average thickness of 32 inches, is worked. The roof is slate and the bottom sandstone. It is developed on the single entry, room and pillar system. Ventilation is produced by fan with a diameter of 16 feet, and is distributed as continuous current. Haulage is conducted from rooms to outside, a distance of 400 feet, by mules; from outside to drum, a distance of 300 feet by locomotive; from drum to foot of incline, a distance of 4,200 feet, by gravity; and from foot of incline to railroad tipple, a distance of 3,800 feet, by locomotive.

MARION COUNTY.

New Etna No. 4 Mine—Owner and Operator, New Etna Coal Co., Chattanooga; President, S. W. Hassell, New York City; Superintendent, Thomas Degnan, Whiteside; Inside Foreman, J. T. Thomas, Whiteside.

This is a Class D slope mine, located 1,180 feet above sea level, in Cumberland Mountain, 1 mile from Whiteside, and connects with N. C. & St. L. Ry. The Kelly seam, having an average thickness of 32 inches, is worked. The roof is sandstone and the bottom slate. It is developed on the single entry, room and pillar system. Ventilation is produced by furnace, with a grate area of 120 feet, and is distributed as continuous current. Haulage is conducted from rooms to outside, a distance of 500 feet, by mules; from outside to incline, a distance of 200 feet, by mules; from top of incline to bottom of incline, a distance of 700 feet, by gravity; and from bottom of incline to railroad, a distance of 4,600 feet, by locomotive.

MARION COUNTY.

New Etna No. 5 Mine—Owner, New Etna Coal Co., Chattanooga; Operator, New Etna Coal Co., under contract with J. C. Higdon, Roope; President, S. W. Hassell, New York City; Superintendent, Thomas Degnan, Whiteside; Inside Foreman, J. C. Higdon, Roope.

This is a Class D slope mine, located 1,480 feet above sea level, in Cumberland Mountain, 2 miles from Roope, and connects with N. C. & St. L. Ry. The Kelly seam, having an average thickness of 32 inches, is worked. The roof is slate and the bottom sandstone. It is developed on the single entry, room and pillar system. Ventilation is produced by furnace with a grate area of 42 feet, and is distributed as continuous current. Haulage is conducted from rooms to outside, a distance of 350 feet, by mules; from outside to tippie, a distance of 600 feet, by mules; from tippie to incline, a distance of 18,400 feet, by locomotive; from top of incline to bottom, a distance of 2,400 feet, by gravity; and from bottom of incline to railroad tippie, a distance of 3,800 feet, by locomotive.

MARION COUNTY.

Pryor Ridge Mine—Owner and Operator, Nunley Ridge Coal Co., Tracy City; *President*, E. L. Hampton, Tracy City; *Secretary*, G. M. Thorogood, Tracy City; *Inside Foreman*, M. T. Tipton, Tracy City.

This is a Class C drift mine, located 1,841 feet above sea level, in Cumberland Mountain, 5 miles from Tracy City, and connects with N. C. & St. L. Ry. The Sewanee seam, having an average thickness of 36 inches, is worked. The roof is slate and sandrock and the bottom slate and fire clay. It is developed on the single entry, room and pillar system. Ventilation is produced by fan with a diameter of 8 feet, and is distributed by the split system. Haulage is conducted from rooms to sidetrack, a distance of 840 feet, by mules; and from sidetrack to tippie, a distance of 670 feet, by mules.

MARION COUNTY.

Tennessee River Mine—Owner and Operator, Tennessee River Coal Co., South Pittsburg; *President*, Lewis Earle, New York City; *Superintendent*, G. H. Crozer, South Pittsburg; *Inside Foreman*, L. S. Bumgardner, Richard City.

This is a Class C drift mine, located 1,600 feet above sea level, in Cumberland Mountain, 5 miles from South Pittsburg, and connects with N. C. & St. L. Ry. The Battle Creek seam, having an average thickness of 60 inches, is worked. The roof is sandstone and the bottom sandstone and fire clay. It is developed on the double entry system. Ventilation is produced by fan with a diameter of — feet. Length of main entry, 416 feet; distance from chute to railroad, 5,900 feet; incline, 2,100 feet.

MARION COUNTY.

Thomas 1-2 Mine—Owner and Operator, Tennessee Coal, Iron & R. R. Co., Birmingham, Ala.; *President*, George G. Crawford, Birmingham, Ala.; *Inside Foreman*, John W. Smith, Whitwell, Tenn.

This is a Class B drift mine, located 1,764 feet above sea level, in Cumberland Mountain, 1 mile from Whitwell, and connects with N. C. & St. L. Ry. The Sewanee seam, having an average thickness of 36 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the single and double entry system. Ventilation is produced by fan with a diameter of 9 feet, and is distributed by the split system. Haulage is conducted from rooms to sidetrack, a distance of 800 feet, by mules; from sidetrack No. 1 to sidetrack No. 2, a distance of 2,000 feet, by mules; from sidetrack No. 2 to pit mouth, a distance of 5,400 feet, by motors; from pit mouth to tippie, a distance of 1,000 feet, by motors; and from tippie to screens, a distance of 5,400 feet, by monitor cars.

MARION COUNTY.

Thomas No. 5 Mine—Owner and Operator, Tennessee Coal, Iron & R. R. Co., Birmingham, Ala.; *President*, George G. Crawford, Birmingham, Ala.; *Inside Foreman*, John W. Smith, Whitwell.

This is a Class B drift mine, located 1,744 feet above sea level, in Cumberland Mountain, 1 mile from Whitwell, and connects with N. C. & St. L. Ry. The Sewanee seam, having an average thickness of 36 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the single and double entry system. Ventilation is produced by fan with a diameter of 9 feet, and is distributed by the split system. Haulage is conducted from rooms to sidetrack, a distance of 700 feet, by mules; from siding to pit mouth, a distance of 1,500 feet, by motors; from pit mouth to tippie, a distance of 6,000 feet, by motors; and from tippie to screens, a distance of 5,400 feet, by monitor cars.

MORGAN COUNTY.

Babahatchie Mine—Owner, Babahatchie Coal Co., Harriman; Operator, Emory River Coal Co., Rockwood; President, W. J. Snow, Rockwood; Secretary, W. D. Kelly, Rockwood; Inside Foreman, W. D. Kelly, Rockwood.

This is a Class D drift mine, located 1,000 feet above sea level, in Cumberland Mountain, 1 mile from Oakdale, and connects with C. N. O. & T. P. Ry. The Babahatchie seam, having an average thickness of 30 inches, is worked. The roof is sandstone and slate and the bottom sandstone. It is developed on the single entry, room and pillar system. Ventilation is produced by furnace with a grate area of 16 feet, and is distributed as continuous current. Haulage is conducted from rooms to tipple, a distance of 350 feet, by mules.

MORGAN COUNTY.

Big Brushy 1-2 Mine—Owner and Operator, Big Brushy Coal & Coke Co., Petros; President, A. H. Wood, Petros; Secretary, W. S. Wood, Petros; Inside Foreman, Sam Price, Petros.

This is a Class C drift mine, located 1,625 feet above sea level, in Big Brushy Mountain, at Petros, and connects with H. & N. E. Division of Southern Railroad. The Jellico seam, having an average thickness of 40 inches, is worked. The roof is slate and sandstone and the bottom fire clay. It is developed on the double entry system. Ventilation is produced by fan with a diameter of 5 feet, and is distributed as continuous current. Haulage is conducted from entries to top of incline, a distance of 5,000 feet, by electric motors; and from top of incline to tipple, a distance of 1,180 feet, by rope.

MORGAN COUNTY.

Big Mt. Mine—Operator, Big Mt. Coal Co., Knoxville; President, Charles Livingston, Knoxville; Secretary, George L. Washburn, Knoxville; Inside Foreman, S. C. Craig, Oliver Springs.

This is a Class A coal mine, operated under lease, located 2,000 feet above sea level, in Cumberland Mountain, 4 miles from Oliver Springs, and connects with Southern Railroad. The Poplar Creek seam, having an average thickness of 36 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the double entry system. Ventilation is produced by furnace with a grate area of 56 feet, and is distributed by break throughs. Haulage is conducted from rooms to mine entrance, a distance of 2,500 feet, by mules; and from mine entrance to chute, a distance of 1,500 feet, by mules.

MORGAN COUNTY.

Blue Ridge Mine—Operator, Blue Ridge Coal Co., Oliver Springs; President, John H. Fritts, Oliver Springs; Inside Foreman, John H. Fritts, Oliver Springs.

This is a Class D drift mine, operated under lease, located 1,200 feet above sea level, in Cumberland Mountain, 3½ miles from Oliver Springs, and connects with Southern Railroad. The Poplar Creek seam, having an average thickness of 48 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the single entry and single room system. Ventilation is produced by furnace with a grate area of 24 feet. Haulage is conducted from rooms to tipple, a distance of 500 feet, by mules; and from tipple to railroad, a distance of 300 feet, by incline.

MORGAN COUNTY.

Bowling No. 1 Mine—Operator, H. B. Bowling Coal Co., Coalfield; President, H. B. Bowling, Clinton; Secretary, C. S. Bowling, Coalfield; Inside Foreman, E. M. Taylor, Coalfield; Gas Boss, Joe Johnson, Coalfield.

This is a class A drift mine, operated under lease, located 1,000 feet above sea level, in Brushy Mountain, 1 mile from Coalfield, and connects with H. & N. E. Division of Southern Railroad. The Coal Creek seam, having on average thickness of 48 inches, is worked. The roof is slate and the bottom slate. It is developed on the double entry, room and pillar system. Ventilation is produced by fan with a diameter of 7 feet, and is distributed as continuous current. Haulage is conducted from rooms to tipple, a distance of 5,000 feet, by electricity.

MORGAN COUNTY.

Bowling No. 2 Mine—Owner and Operator, H. B. Bowling Coal Co., Coalfield; President, H. B. Bowling, Coalfield; Secretary, C. S. Bowling, Coalfield; Inside Foreman, E. M. Taylor, Coalfield; Gas Boss, Joe Johnson, Coalfield.

This is a Class A drift mine, located 1,000 feet above sea level, in Big Brushy Mountain, 12 miles from Harriman, and connects with H. & N. E. Division of Southern Railroad. The Coal Creek seam, having an average thickness of 48 inches, is worked. The roof is slate and the bottom slate and clay. It is developed on the double entry, room and pillar system. Ventilation is produced by fan with a diameter of 7 feet, and is distributed as continuous current. Haulage is conducted from rooms to tippie, a distance of 1,000 feet, by electricity.

MORGAN COUNTY.

Brushy Mt. No. 1 Mine—Owner and Operator, State of Tennessee, Nashville; *General Manager*, H. F. Rogers, Petros; *Inside Foreman*, John Boone, Petros.

This is a Class B drift mine, located 1,619 feet above sea level, in Brushy Mountain, 1 mile from Petros, and connects with H. & N. E. Division of Southern Railroad. The Brushy Mountain seam, having an average thickness of 30 inches, is worked. The roof is slate and the bottom muck and slate. It is developed on the double entry system. Ventilation is produced by fan with a diameter of 16 feet. Haulage is conducted from rooms to sidetrack, a distance of 950 feet, by mules; from sidetrack to tippie, a distance of 7,000 feet, by motors; from tippie to railroad tippie, a distance of 700 feet, by monitor cars.

MORGAN COUNTY.

Brushy Mt. No. 3 Mine—Owner and Operator, State of Tennessee, Nashville; *General Manager*, H. F. Rogers, Petros; *Inside Foreman*, W. P. Rogers, Petros.

This is a Class B drift mine, located 1,620 feet above sea level, in Frozen Head Mountain, 1 mile from Petros, and connects with H. & N. E. Division of Southern Railroad. The Brushy Mountain seam, having an average thickness of 32 inches, is worked. The roof is slate and the bottom muck and slate. It is developed on the double entry system. Ventilation is produced by two fans with a diameter of 9 and 7 feet, and is distributed by the multiple system. Haulage is conducted from rooms to sidetrack, a distance of 1,000 feet, by mules; from sidetrack to tippie, a distance of 4,000 feet, by motors; and from tippie to railroad tippie, a distance of 700 feet, by monitor cars.

MORGAN COUNTY.

Butler No. 2 Mine—Operator, Butler Coal Mining Co., Oliver Springs; *President*, J. L. Boyd, Knoxville; *Secretary*, S. V. Carter, Knoxville.

This is a Class B drift mine, operated under lease, located 1,200 feet above sea level, in Brushy Mountain, 4 miles from Oliver Springs, and connects with Southern Railroad. The Coal Creek seam, having an average thickness of 48 inches, is worked. The roof is slate and the bottom stone. There is no defined system of works, as there are several openings. Ventilation is produced by furnace. Haulage is conducted from rooms to knuckle, a distance of 300 feet, by mules; and from knuckle to railroad chute, a distance of 1,300 feet, by gravity.

MORGAN COUNTY.

Cow Creek Mine—Owner, E. A. Reed, Oliver Springs; *Operator*, Cow Creek Coal Co., Oliver Springs; *President*, E. A. Reed, Oliver Springs; *Superintendent*, W. S. Mullins, Oliver Springs; *Inside Fireman*, W. S. Mullins, Oliver Springs.

This is a Class C drift mine, located 1,150 feet above sea level, in Cumberland Mountain, 1½ miles from Oliver Springs, and connects with Southern Railroad. The Coal Creek seam, having an average thickness of 40 inches, is worked. The roof and bottom are both slate. It is developed on the double entry system. Ventilation is produced by furnace with a grate area of 32 feet, and is distributed by the split system. Haulage is conducted from rooms to mine entrance, a distance of 300 feet, by mules; and from mine entrance to tippie, a distance of 2,600 feet, by mules.

MORGAN COUNTY.

Dixie Mine—Operator, Dixie Coal Co., Oliver Springs; *Secretary*, C. C. Liles, Petros.

This is a Class C drift mine, operated under lease, located 1,150 feet above sea level, in Cumberland Mountain, 2 miles from Oliver Springs, and connects with Southern Railroad. The Coal Creek seam, having an average thickness of 36 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the single entry, room and pillar system. Ventilation is produced by natural conditions. Haulage is conducted from rooms to tippie, a distance of 500 feet, by mules.

MORGAN COUNTY.

Fagan Mine—Owner, Operator and President, J. A. Fagan, Coalfield; Inside Foreman, J. A. Fagan, Coalfield.

This is a Class D drift mine, located 800 feet above sea level, in Tar Kiln Ridge, at Blue Gem, and connects with H. & N. E. Division of Southern Railroad. The Blue Gem seam, having an average thickness of 24 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the single entry system. Ventilation is produced by natural conditions. Haulage is conducted from rooms to outside, a distance of 100 feet, by mules; and from outside to tippie, a distance of 300 feet, by mules.

MORGAN COUNTY.

Fairchild Mine—Operator, W. G. Fairchild, Mill Creek.

This is a Class D drift mine, operated under lease, located 1,185 feet above sea level, in Cumberland Mountain, 1½ miles from Huffman, and connects with Southern Railroad. The Glen Mary seam, having an average thickness of 18 inches, is worked. The roof is slate and the bottom clay. It is developed on the single entry system. Ventilation is produced by furnace, with a grate area of 4 feet. Haulage is conducted from rooms to outside, a distance of 50 feet, by mules.

MORGAN COUNTY.

Harriman Mine—Operator, Harriman Coal Co., Harriman; President, E. F. Blizzard, Harriman; Secretary, G. C. Goodrich, Harriman; Inside Foreman, E. F. Blizzard, Harriman.

This is a Class D drift mine, operated under lease, located 1,100 feet above sea level, in Waldens Ridge, 9 miles from Harriman, and connects with H. & N. E. Division of Southern Railroad. The No. 7 seam, having an average thickness of 38 inches, is worked. The roof and bottom are both slate. It is developed on the single entry system. Ventilation is produced by natural conditions. Haulage is conducted from rooms to mine entrance, a distance of 200 feet, by engine hoist; from mine entrance to incline, a distance of 300 feet, by mules, and from incline to tippie, a distance of 5,200 feet, by gravity.

MORGAN COUNTY.

Jackson Mine—Operator, Jackson Bros. Coal Co., Oliver Springs; President, Alex Jackson, Oliver Springs; Inside Foreman, Thomas Jackson, Oliver Springs.

This is a Class C drift mine, operated under lease, located 1,100 feet above sea level, in Cumberland Mountain, 2 miles from Oliver Springs, and connects with Southern Railroad. The Coal Creek seam, having an average thickness of 40 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the single entry, room and pillar system. Ventilation is produced by furnace, with a grate area of 6 feet, and is distributed by natural conditions. Haulage is conducted from rooms to chute, a distance of 3,000 feet, by mules, and from chute to railroad, a distance of 400 feet, by incline.

MORGAN COUNTY.

Little Brushy Mine—Operator, Little Brushy Coal Co., Coalfield; Superintendent, Owen Bowling, Coalfield; Inside Foreman, J. A. Fagan, Coalfield.

This is a Class C drift mine, located 1,675 feet above sea level, in Little Brushy Mountain, 2 miles from Coalfield, and connects with H. & N. E. division of Southern Railroad. The Jellico seam, having an average thickness of 36 inches, is worked. The roof and bottom are both sandstone. It is developed on the single entry and airway, room and pillar system. Ventilation is produced by furnace, with a grate area of 30 feet, and is distributed as continuous current. Haulage is conducted from rooms to incline, a distance of 1,900 feet, by mules, and from incline to tippie at railroad, a distance of 1,780 feet, by rope.

MORGAN COUNTY.

Mt. Carbon Mine—Owner, Mrs. W. C. Walker, Oliver Springs; Operator, Mt. Carbon Coal Co., Oliver Springs; President, Wm. Fritts, Oliver Springs; Secretary, J. H. Fritts, Oliver Springs; Inside Foreman, Wm. Fritts, Oliver Springs.

This is a Class B drift mine, located 1,400 feet above sea level, in Cumberland Mountain, 2 miles from Oliver Springs, and connects with Southern Railroad. The

Mt. Carbon seam, having an average thickness of 42 inches, is worked. The roof is slate and the bottom slate and fire clay. Mining consists of pulling stumps and pillars. Ventilation is produced by furnace, with a grate area of 6 feet. Haulage is conducted from rooms to mine entrance, a distance of 300 feet, by mules; from mine entrance to chute No. 1, and from chute No. 1 to incline, a distance of 2,850 feet, by tram.

MORGAN COUNTY.

Oliver Mine—*Owner*, Richards Bros., Oliver Springs; *Operator*, Oliver Coal Co., Oliver Springs; *President*, W. D. Richards, Oliver Springs; *Secretary*, John R. Richards, Oliver Springs; *Inside Foreman*, Edward Duggans, Oliver Springs.

This is a Class D drift mine, located 800 feet above sea level, in Cumberland Mountain, $3\frac{1}{2}$ miles from Oliver Springs, and connects with Southern Railroad. The Coal Creek seam, having an average thickness of 48 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the single entry system. Ventilation is produced by furnace, with a grate area of 6 feet. Haulage is conducted from rooms to chute, a distance of 900 feet, by mules.

MORGAN COUNTY.

Poplar Creek Mine—*Owner*, Coal Creek Mining & Mfg. Co., Knoxville; *Operator*, Poplar Creek Coal Co., Oliver Springs; *President*, Thos. Pruden, Knoxville; *Secretary*, S. M. Leath, Clinton; *Inside Foreman*, W. W. Leach, Oliver Springs; *Gas Boss*, W. W. Leach, Oliver Springs.

This is a Class A mine, located 1,150 feet above sea level, in Cumberland Mountain, 4 miles from Oliver Springs, and connects with Southern Railroad. The Coal Creek seam, having an average thickness of 44 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the double entry and single room system. Ventilation is produced by fan, with a diameter of 16 feet, and is distributed as continuous current. Haulage is conducted from rooms to sidetrack, a distance of 2,500 feet, by mules, and from sidetrack to tippie, a distance of 3,300 feet, by rope.

MORGAN COUNTY.

Prudential Mine—*Operator, President and Secretary*, J. K. Butler, Oliver Springs; *Inside Foreman and Gas Boss*, Sam Price, Oliver Springs.

This is a Class A drift mine, operated under lease, located 1,000 feet above sea level, in Cumberland Mountain, $3\frac{1}{2}$ miles from Oliver Springs, and connects with Southern Railroad. The Coal Creek seam, having an average thickness of 48 inches, is worked. The roof is slate and the bottom clay. It is developed on the single entry system. Ventilation is produced by furnace with a grate area of 42 feet. Haulage is conducted from rooms to drum, a distance of 2,000 feet, by mules; and from drum to tippie, a distance of 600 feet, by rope incline.

OVERTON COUNTY.

Brier Hill No. 1 Mine—*Owner and Operator*, The Brier Hill Collieries, Crawford; *President*, W. L. Wagner, New York; *Secretary*, F. R. Russell New York; *Inside Foreman*, A. C. Erwin, Crawford.

This is a Class C drift mine, located 1,690 feet above sea level, in Cumberland Mountain, 2 miles from Crawford, and connects with Tennessee Central Railroad. The Bon Air seam, having an average thickness of 40 inches, is worked. The roof is slate and sandstone and the bottom sandstone. It is developed on the room and pillar system. Ventilation is produced by fan with a diameter of 14 feet, and is distributed by the split system. Haulage is conducted from rooms to sidetrack, a distance of 1,900 feet, by mules; and from sidetrack to tippie, a distance of 3,100 feet, by motors.

OVERTON COUNTY.

Brier Hill No. 2 Mine—*Owner and Operator*, The Brier Hill Collieries, Crawford; *President*, W. L. Wagner, New York; *Secretary*, F. R. Russell, New York; *Inside Foreman*, A. C. Erwin, Crawford.

This is a Class C drift mine, located 1,680 feet above sea level, in Cumberland Mountain, 2 miles from Crawford, and connects with Tennessee Central Railroad. The Bon Air seam, having an average thickness of 40 inches, is worked. The roof is slate and sandstone and the bottom sandstone. It is developed on the room and pillar system. Ventilation is produced by fan with a diameter of 15 feet. Haulage is conducted from rooms to sidetrack, a distance of 1,150 feet, by mules; from sidetrack to tippie, a distance of 2,000 feet, by motors.

OVERTON COUNTY.

Brier Hill No. 4 Mine—Owner and Operator, The Brier Hill Collieries, Crawford; President, W. L. Wagner, New York; Secretary, F. R. Russell, New York; Inside Foreman, A. C. Erwin, Crawford.

This is a Class C drift mine, located 1,680 feet above sea level, in Cumberland Mountain, 2 miles from Crawford, and connects with Tennessee Central Railroad. The Bon Air seam, having an average thickness of 38 inches, is worked. The roof is slate and sandstone and the bottom sandrock. It is developed on the room and pillar system. Ventilation is produced by furnace with a grate area of 56 feet, and is distributed by the split system. Haulage is conducted from rooms to sidetrack, a distance of 700 feet, by mules; and from sidetrack to tippie, a distance of 1,400 feet, by mules.

OVERTON COUNTY.

Laurel Creek Mine—Owner, George M. Fritts, Wilder; Operator, Laurel Creek Coal Co., Wilder; President, George M. Fritts, Wilder; Inside Foreman, Pless Cravens, Wilder.

This is a Class D drift mine, located 1,668 feet above sea level, in Cumberland Mountain, 2½ miles from Davidson, and connects with Tennessee Central Railroad. The No. 2 Bon Air seam, having an average thickness of 60 inches, is worked. The roof and bottom are both sandstone. It is developed on the single entry and air course system. Ventilation is produced by furnace with a grate area of 16 feet, and is distributed as continuous current. Haulage is conducted from rooms to mine entrance, a distance of 315 feet, by mules; and from mine entrance to tippie, a distance of 140 feet, by mules.

OVERTON COUNTY.

Obey City No. 1 Mine—Owner, Obey River Coal Co., Nashville; Operator, Obey City Coal Co., Obey City; President, A. D. Eatherly, Obey City; Secretary, C. B. Eatherly, Obey City; Inside Foreman, George C. Gallegly, Obey City.

This is a Class C drift mine, located 1,600 feet above sea level, in Cumberland Mountain, ½ mile from Obey City, and connects with Tennessee Central Railroad. The Crawford seam, having an average thickness of 34 inches, is worked. The roof is shale and the bottom black jack and shale. It is developed on the double and single entry system. Ventilation is produced by furnace with a grate area of 22 feet, and is distributed as continuous current. Haulage is conducted from coal face to outside sidetrack, an average of 750 feet, by mules; and from outside sidetrack to tippie, a distance of 500 feet, by mules.

OVERTON COUNTY.

Peacock No. 4-5 Mine—Owner, Peacock Coal & Coke Co., Obey City; Operator, J. C. Lusk, Obey City; President, J. T. Odum, Lebanon; Inside Foreman, J. C. Lusk, Obey City.

This is a Class B drift mine, located 1,700 feet above sea level, in Cumberland Mountain, ¼ mile from Obey City, and connects with Tennessee Central Railroad. The Bon Air No. 2 seam, having an average thickness of 36 inches, is worked. The roof is slate and the bottom slate and fire clay. It is developed on the double and single entry system. Ventilation is produced by furnace, with a grate area of 20 feet. Haulage is conducted from rooms to tippie, a distance of 1,000 feet, by mules.

RHEA COUNTY.

Fox No. 1 Mine—Owner and Operator, Fox Coal Co., Chattanooga; President, P. D. Montague, Chattanooga; Secretary, D. H. Rains, Chattanooga; Inside Foreman, S. P. Loggins, Graysville.

This is a Class A drift mine, located 950 feet above sea level, in Waldens Ridge, 3 miles from Graysville, and connects with C., N. O. & T. P. Railway. The No. 2 seam, having an average thickness of 60 inches, is worked. The roof is slaty shale and the bottom sandy shale. It is developed on the room and pillar system. Ventilation is produced by fan, with a diameter of 10 feet, and is distributed as continuous current. Haulage is conducted from rooms to mine entrance, a distance of 3,700 feet, by mules; from pit mouth to tippie, a distance of 2,000 feet, by locomotive, and from tippie to railroad, a distance of 11,000 feet, by locomotive.

RHEA COUNTY.

Fox No. 2 Mine—Owner and Operator, Fox Coal Co., Chattanooga; President, D. P.

Montague, Chattanooga; *Secretary*, D. H. Rains, Chattanooga; *Inside Foreman*, S. P. Loggins, Graysville.

This is a Class A drift mine, located 1,250 feet above sea level, in Waldens Ridge, $3\frac{1}{2}$ miles from Graysville, and connects with C., N. O. & T. P. Railway. The No. 5 seam, having an average thickness of 30 inches, is worked. The roof is slate and the bottom sand shale. It is developed on the double entry, room and pillar system. Ventilation is produced by fan, with a diameter of 12 feet, and is distributed by the split system. Haulage is conducted from rooms to sidetrack, a distance of 1,500 feet, by mules; from sidetrack to tip house, a distance of 4,000 feet, by rope; from tip house to second tippie, a distance of 4,000 feet, by locomotive, and from tippie to railroad, a distance of 11,000 feet, by locomotive.

RHEA COUNTY.

Fox No. 3 Mine—Owner and Operator, Fox Coal Co., Chattanooga; *President*, D. P. Montague, Chattanooga; *Secretary*, D. H. Rains, Chattanooga; *Inside Foreman*, S. P. Loggins, Graysville.

This is a Class A drift mine, located 1,250 feet above sea level, in Waldens Ridge, $3\frac{1}{2}$ miles from Graysville, and connects with C., N. O. & T. P. Railway. The No. 5 seam, having an average thickness of 27 inches, is worked. The roof is slate and sandstone and the bottom sand shale. It is developed on the room and pillar system. Ventilation is produced by fan, with a diameter of 10 feet, and is distributed as continuous current. Haulage is conducted from rooms to chute, a distance of 2,500 feet, by mules; from chute to tippie, a distance of 4,400 feet, by locomotive, and from tippie No. 2 to railroad, a distance of 11,000 feet, by locomotive.

RHEA COUNTY.

Fox No. 4 Mine—Owner and Operator, Fox Coal Co., Chattanooga; *President*, P. D. Montague, Chattanooga; *Secretary*, D. H. Rains, Chattanooga; *Inside Foreman*, S. P. Loggins, Graysville.

This is a Class A drift mine, located 970 feet above sea level, in Waldens Ridge, $2\frac{1}{2}$ miles from Graysville, and connects with C., N. O. & T. P. Ry. Co. The No. 2 seam, having an average thickness of 42 inches, is worked. The roof is slaty shale and the bottom sandy shale. It is developed on the room and pillar system. Ventilation is produced by furnace, with a grate area of 20 feet, and is distributed as continuous current. Haulage is conducted from rooms to chute, a distance of 600 feet, by mules; from chute to tippie, a distance of 4,400 feet, by locomotive, and from tippie to railroad, a distance of 11,000 feet, by locomotive.

RHEA COUNTY.

New Prospect Mine—Owner and Operator, Dayton Coal & Iron Co., Dayton; *Mgr. Director*, Peter Donaldson, Glasgow, Scotland; *Superintendent*, Jos. Cain, Dayton; *Inside Foreman*, J. C. Pressnell, Dayton; *Gas Boss*, Ben Blye, Dayton.

This is a Class A slope mine, located 840 feet above sea level, in Waldens Ridge, $2\frac{3}{4}$ miles from Dayton, and connects with C., N. O. & T. P. Ry. Co. The Nelson Coal seam, having an average thickness of 42 inches, is worked. The roof and bottom are both sandrock. It is developed on the room and entry system. Ventilation is produced by fan, with a diameter of 18 feet, and is distributed as continuous current. Haulage is conducted from railroad tippie to mouth of slope, a distance of 600 feet, by rope; from slope mouth to slope sidetrack, a distance of 760 feet, by rope; from slope sidetrack to slope face, a distance of 175 feet, by snatch rope; from slope to first cross entry, a distance of 175 feet, by rope; from rope to head cross entry, a distance of 395 feet, by mules; from slope to second cross entry, a distance of 175 feet, by rope; from rope to head of cross entry, a distance of 150 feet, by mules, and from rope to third cross entry, a distance of 150 feet, by mules.

RHEA COUNTY.

Richland No. 13-14 Mine—Owner and Operator, Dayton Coal & Iron Co., Ltd., Dayton; *Managing Director*, Peter Donaldson, Glasgow, Scotland; *Superintendent*, Jos. Cain, Dayton; *Inside Foreman*, Nash Holden, Dayton; *Gas Boss*, H. E. Morgan, Dayton.

This is a Class B drift mine, located 985 feet above sea level, in Waldens Ridge, $2\frac{3}{4}$ miles from Dayton, and connects with C., N. O. & T. P. Ry. Co. The Richland seam, having an average thickness of 22 inches, is worked. The roof and bottom are both slate and stone. It is developed on the single entry, single room and pillar

system. Ventilation is produced by fan, with a diameter of 18 feet, and is distributed by the split system. Haulage is conducted from tippie to mine mouth, a distance of 200 feet, by rope; from mine mouth to C. district sidetrack, a distance of 600 feet, by rope; from C. district sidetrack to N. P. district sidetrack, a distance of 700 feet, by rope; from rope sidetrack to head of main E. C. D., a distance of 2,550 feet, by mules; from rope sidetrack to head of M. E. N. P. District, a distance of 1,925 feet, by mules, and from main entry C. District to head of 1, 3 and 5 cross entries, a distance of 8,800 feet, by mules, and from main entry N. P. District to head of all cross entries, a total distance of 7,480 feet, by mules.

RHEA COUNTY.

Spring City Mine—Owner, Waterhouse Heirs, Spring City; *Operator*, Simpson & Dodson, Spring City; *Inside Foreman*, J. C. Dodson.

This is a Class C drift mine, located 1,000 feet above sea level, in Waldens Ridge, $1\frac{1}{4}$ miles from Spring City, and connects with C., N. O. & T. P. Ry. Co. The Nelson seam, having an average thickness of 30 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the single entry system. Ventilation is produced by natural conditions. Haulage is conducted from heading to chute, a distance of 150 feet, by hand and conveyed to Spring City by mules and sold to local trade.

ROANE COUNTY.

Old Mine—Owner and Operator, Roane Iron Co., Rockwood; *President*, H. S. Chamberlain, Chattanooga; *Inside Foremen*, W. T. Richards and W. S. Scarbrough, Rockwood; *Gas Bosses*, W. C. Wright, Jas. King, N. Dale, and Tom Lane, Rockwood.

This is a Class A slope mine, located 1,600 feet above sea level, in Cumberland Mountain, 1 mile from Rockwood, and connects with C., N. O. & T. P. and Tennessee Central Railroads. The Sganee seam, having an average thickness of 48 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the single entry, room and pillar system. Ventilation is produced by fan, with a diameter of 20 feet, and is distributed by the split system. Haulage is conducted from face workings to slope, a distance of 10,000 feet, by mules, and from end of slope to tippie, a distance of 5,000 feet, by rope.

SCOTT COUNTY.

Baker Mine—Owner, Bird M. Robinson, New York City; *Operator*, Baker Coal & Coke Co., Newland; *President*, B. A. Newland, Oneida; *Superintendent*, A. McDonald, Harriman; *Inside Foreman*, Harry Swift, Newland.

This is a Class C drift mine, located 1,500 feet above sea level, in Arch Mountain, $\frac{1}{2}$ mile from Newland, and connects with Tennessee Central and C., N. O. & T. P. Railroads. The Big Dean seam, having an average thickness of 36 inches, is worked. The roof is slate and the bottom fire clay and stone. It is developed on the single entry system. Ventilation is produced by furnace, with a grate area of 36 feet, and is distributed as continuous current. Haulage is conducted from rooms to drum house, a distance of 400 feet, by mules, and from drum house to railroad, a distance of 1,700 feet, by gravity incline.

SCOTT COUNTY.

Glen Mary No. 2-4 Mine—Owner and Operator, Glen Mary Coal & Coke Company, Glen Mary; *President*, Gus Carter, Glen Mary; *Secretary*, J. P. Shaw, Glen Mary; *Inside Foreman*, J. M. Carson, Glen Mary.

This is a Class C drift mine, located 1,470 feet above sea level, in Young Mountain, 2 miles from Glen Mary, and connects with C., N. O. & T. P. Ry. Co. The No. 4 Glen Mary seam, having an average thickness of 26 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the entry and air course, room and pillar system. Ventilation is produced by furnace, with a grate area of 45 feet, and is distributed as continuous current. Haulage is conducted from rooms to siding outside, a distance of 1,700 feet, by mules, and from siding to tippie, a distance of 10,000 feet, by dinky engines.

SCOTT COUNTY.

Glen Mary No. 5 Mine—Owner and Operator, Glen Mary Coal & Coke Co., Glen Mary; *President*, Gus Carter, Glen Mary; *Secretary*, J. P. Shaw, Lexington, Ky.; *Inside Foreman*, J. M. Carson, Glen Mary.

This is a Class C drift mine, located 1,480 feet above sea level, in Diden Ridge, 3 miles from Glen Mary, and connects with C., N. O. & T. P. Ry. Co. The No. 4 Glen

Mary seam, having an average thickness of 28 inches, is worked. The roof is slate and the bottom rock and fire clay. It is developed on the entry and air course, room and pillar system. Ventilation is produced by furnace, with a grate area of 60 feet, and is distributed as continuous current. Haulage is conducted from face to sidetrack outside, a distance of 1,500 feet, by mules, and from siding to tippie, a distance of 15,000 feet, by dinkey engines.

SCOTT COUNTY.

Lehigh No. 5 Mine—Owner, Ridgeway Sprinkle Coal & Lumber Co., Philadelphia; Operator, Scott County Coal Co., Helenwood; President, B. A. Treat, Harriman; Secretary, M. W. Walker, Helenwood; Inside Foreman, J. C. Pemberton, Helenwood.

This is a Class C drift mine, located 1,700 feet above sea level, in Cumberland Mountain, $\frac{3}{4}$ mile from Helenwood, and connects with C., N. O. & T. P. Ry. Co. The No. 4 Glen Mary seam, having an average thickness of 36 inches, is worked. The roof is slate and the bottom rock. It is developed on the air course, single room and pillar system. Ventilation is produced by furnace, with a grate area of 48 feet, and is distributed by doors and brattices. Haulage is conducted from rooms to tippie, a distance of 2,700 feet, by mules.

SCOTT COUNTY.

Lehigh No. 6 Mine—Owner, Ridgeway-Sprinkle Coal Co., Philadelphia, Pa., Operator Scott County Coal Co., Helenwood; President, B. A. Treat, Helenwood; Secretary, M. W. Walker, Helenwood; Inside Foreman, J. C. Pemberton, Helenwood.

This is a Class C drift mine, located 1,700 feet above sea level, in Cumberland Mountain, $\frac{1}{2}$ mile from Helenwood, and connects with C., N. O. & T. P. Ry. Co. The No. 4 seam, having an average thickness of 39 inches, is worked. The roof is slate and the bottom rock. It is developed on the entry and air course, single room and pillar system. Ventilation is produced by furnace, with a grate area of 36 feet, and is distributed by doors and brattices. Haulage is conducted from rooms to tippie, a distance of 3,000 feet, by mules.

SCOTT COUNTY.

Lemoyne Mine—Owner and Operator, J. V. Lemoyne, Baltimore, Md.; President, John V. Lemoyne, Baltimore, Md.; Inside Foreman, John Chambers, Isham.

This is a Class B drift mine, located 1,400 feet above sea level, in Gum Fork Mountain, $4\frac{1}{2}$ miles from Isham, and connects with C., N. O. & T. P. Ry. Co. The No. 4 seam, having an average thickness of 30 inches, is worked. The roof is slate and the bottom shale. It is developed on the double entry, room and pillar system. Ventilation is produced by furnace, with a grate area of 33 feet. Haulage is conducted from rooms to sidetrack, a distance of 360 feet, by mules, and from sidetrack to tippie, a distance of 910 feet, by mules.

SCOTT COUNTY.

Oneida Mine—Owner and Operator, Oneida Coal Co., Oneida; President, A. C. Terry, Oneida; Secretary, J. M. Terry, Oneida; Inside Foreman, M. E. Terry, Oneida;

This is a Class C drift mine, located 1,450 feet above sea level, in Cumberland Mountain, 4 miles from Oneida, and connects with the Tennessee and C., N. O. & T. P. Railroads. The Paint Rock seam, having an average thickness of 30 inches, is worked. The roof is slate and the bottom sandstone. It is developed on the single entry system. Ventilation is produced by two furnaces, with a grate area of 48 feet each. Haulage is conducted from rooms to mine entrance, a distance of 800 feet, by mules, and from mine entrance to tippie, a distance of 1,000 feet, by mules.

SCOTT COUNTY.

Paint Rock No. 1 Mine—Owner, Paint Rock Coal Co., Harriman; Operator, Paint Rock Coal Mining Co., Oneida, R. F. D. Almy; Receiver, J. D. Roberts, Harriman.

This is a Class B drift mine, located 1,300 feet above sea level, in Cumberland Mountain, $\frac{1}{2}$ mile from Almy, and connects with the Tennessee and C., N. O. & T. P. Railroads. The No. 5 seam, having an average thickness of 30 inches, is worked. The roof is slate and the bottom stone. It is developed on the entry and air course system. Ventilation is produced by furnace, with a grate area of 48 feet. Haulage is conducted from rooms to tippie, a distance of 1,300 feet, by mules.

SCOTT COUNTY.

Paint Rock No. 2 Mine—Owner, Paint Rock Coal Co., Harriman; Operator, Paint Rock Coal Mining Co., Oneida, R. F. D. Almy; Receiver, J. D. Roberts, Harriman.

This is a Class B drift mine, located 1,300 feet above sea level, in Cumberland Mountain, one mile from Almy, and connects with Tennessee and C., N. O. & T. P. Railroads. The No. 5 seam, having an average thickness of 27 inches, is worked. The roof is slate and the bottom stone. It is developed on the entry and air course system. Ventilation is produced by furnace, with a grate area of 48 feet. Haulage is conducted from rooms to sidetrack, a distance of 1,000 feet, by mules, and from sidetrack to tipple a distance of 2,800 feet, by mules.

SCOTT COUNTY.

Paint Rock No. 3 Mine—*Owner*, Paint Rock Coal Co., Harriman; *Operator*, Paint Rock Coal Mining Co., Oneida, R. F. D. Almy; *Receiver*, J. D. Roberts, Harriman.

This is a Class C drift mine, located 1,400 feet above sea level, in Cumberland Mountain, ½ mile from Almy, and connects with Tennessee and C., N. O. & T. P. Railroads. The No. 5 seam, having an average thickness of 28 inches, is worked. The roof is slate and the bottom stone. It is developed on the entry and air course, room and pillar system. Ventilation is produced by furnace, with a grate area of 48 feet. Haulage is conducted from rooms to mine entrance, a distance of 2,000 feet, by mules, and from mine entrance to tipple, a distance of 400 feet, by mules.

SCOTT COUNTY.

Pine Knot Mine—*Owner*, Paint Rock Coal Co., Harriman; *Operator*, Pine Knot Coal Co., Harriman; *President*, D. Denny, Harriman; *Secretary*, A. McDonald, Harriman; *Inside Foreman*, Jerry Conner, Laxton.

This is a Class B mine, located 1,340 feet above sea level, in Cumberland Mountain, five miles from Oneida, and connects with Tennessee Railroad. The No. 5 seam, having an average thickness of 27 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the room and pillar system. Ventilation is produced by furnace, with a grate area of — feet, and is distributed by the airway system. Haulage is conducted from face of coal to opening, a distance of 3,000 feet, by mules, and from opening to tipple, a distance of 900 feet, by mules.

SCOTT COUNTY.

Robbins Blue Gem Mine—*Operator and President*, Jasper Hughett, Robbins.

This is a Class C slope mine, located 1,500 feet above sea level, in Cumberland Mountain, ¼ mile from Robbins, and connects with C., N. O. & T. P. Railroad. The Tenn. Blue Gem seam, having an average thickness of 20 inches, is worked. The roof and bottom are both slate. It is developed on the entry and air course system. Ventilation is produced by furnace, with a grate area of 20 feet, and is distributed as continuous current. Haulage is conducted from rooms to mine entrance, a distance of 400 feet, by mules.

SCOTT COUNTY.

Southern Clay Mine—*Owner and Operator*, Southern Clay Mfg. Co., Chattanooga; *President*, W. M. Lasley, Chattanooga; *Secretary*, W. C. Brown, Chattanooga; *Inside Foreman*, N. J. Staly, Robbins.

This is a Class D drift mine, located 1,400 feet above sea level, in Cumberland Mountain, 1 mile from Robbins, and connects with C., N. O. & T. P. Railroad. The Glen Mary No. 4 seam, having an average thickness of 24 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the entry and air course, room and pillar system. Ventilation is produced by furnace, with a grate area of 24 feet. Haulage is conducted from headings to mine mouth, a distance of 1,200 feet, by mules.

SCOTT COUNTY.

Stanley Mine—*Owner*, Paint Rock Coal Co., Harriman; *Operator*, Stanley Coal Co., Harriman; *President*, A. McDonald, Harriman; *Inside Foreman*, Alfred West, Oneida, R. F. D. Fogal.

This is a Class B drift mine, located 1,400 feet above sea level, in Paint Rock Mountain four miles from Oneida, and connects with Tennessee Railroad. The Paint Rock seam, having an average thickness of 30 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the entry and air course, room and pillar system. Ventilation is produced by furnace, with a grate area of 24 feet. Haulage is conducted from face of entry to tipple, a distance of 1,600 feet, by mules.

SEQUATCHIE COUNTY.

Douglass No. 2 Mine—*Owner and Operator*, Southern Iron & Steel Co., Birmingham,

Ala.; *President*, W. H. Hassenger, Birmingham, Ala.; *Secretary*, P. R. Forsyth, Birmingham, Ala.; *Inside Foreman*, John Degnan, Dunlap.

This is a Class C drift mine, located 1,660 feet above sea level, in Cumberland Mountain, 1 mile from Dunlap, and connects with N., C. & St. L. Railroad. The Sewanee seam, having an average thickness of 48 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the double entry, double room system. Ventilation is produced by fan, with a diameter of 12 feet, and is distributed by the split system. Haulage is conducted from rooms to first siding, a distance of 600 feet, by mules; from first siding to second siding, a distance of 2,700 feet, by rope; from second siding to third siding, a distance of 2,000 feet, by mules; from third siding to mouth of mine, a distance of 2,000 feet, by mules; from mouth of mine to tippie, a distance of 3,900 feet, by locomotives, and from tippie to railroad, a distance of 3,900 feet, by gravity incline.

WHITE COUNTY.

Bon Air (Shaft) Mine—Owner and Operator, Bon Air Coal & Iron Co., Nashville; *President*, John P. Williams, Nashville; *Secretary*, C. Cooper, Nashville; *Inside Foreman*, Shell Rinehart, Bon Air.

This is a Class C shaft mine, located 1,857 feet above sea level, in Cumberland Mountain, $1\frac{1}{4}$ miles from Bon Air, and connects with N., C. & St. L. Railroad. The Bon Air seam, having an average thickness of 36 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the double entry, room and pillar system. Ventilation is produced by fan, with a diameter of — feet. Electric haulage will be installed when ready for operation.

WHITE COUNTY.

Bon Air No. 6 Mine—Owner and Operator, Bon Air Coal & Iron Co., Nashville; *President*, John P. Williams, Nashville; *Secretary*, C. Cooper, Nashville; *Inside Foreman*, J. W. King, Bon Air.

This is a Class C drift mine, located 1,646 feet above sea level, in Cumberland Mountain, $\frac{3}{8}$ mile from Bon Air, and connects with N., C. & St. L. Railroad. The Bon Air seam, having an average thickness of 36 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the double entry, room and pillar system. Ventilation is produced by fan, with a diameter of 18 feet, and is distributed as continuous current. Haulage is conducted from rooms to sidetrack, a distance of 1,000 feet, by mules, and from sidetrack to tippie, a distance of 3,400 feet, by tail rope.

WHITE COUNTY.

Clifty Creek No. 1 Mine—Owner and Operator, Clifty Creek Coal Co., Clifty; *President*, R. R. Moody, Springfield, Mass.; *Inside Foreman*, Joe Ledford, Clifty.

This is a Class C drift mine, located 1,600 feet above sea level, in Cumberland Mountain, $\frac{1}{4}$ mile from Clifty, and connects with N., C. & St. L. Railroad. The Sewanee seam, having an average thickness of 36 inches, is worked. The roof is sandrock and the bottom fire clay. It is developed on the double entry system. Ventilation is produced by furnace, with a grate area of 50 feet, and is distributed by the split system. Haulage is conducted from headings to tippie; an average distance of 3,000 feet, by mules.

WHITE COUNTY.

Clifty Creek No. 2 Mine—Owner and Operator, Clifty Creek Coal Co., Clifty; *President*, R. R. Moody, Springfield, Mass.; *Inside Foreman*, Joe Ledford, Clifty.

This is a Class C drift mine, located 1,600 feet above sea level, in Cumberland Mountain, $\frac{1}{4}$ mile from Clifty, and connects with N., C. & St. L. Railroad. The Sewanee seam, having an average thickness of 48 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the double entry system. Ventilation is produced by furnace, with a grate area of 20 feet, and is distributed by the split system.

Haluage is conducted from rooms to mine entrance, a distance of 1,000 feet, by mules, and from mine entrance to tippie, a distance of 500 feet, by mules.

WHITE COUNTY.

Clifty Creek No. 3 Mine—Owner and Operator, Clifty Creek Coal Co., Clifty; *President*, R. R. Moody, Springfield, Mass.; *Inside Foreman*, Joe Ledford, Clifty.

This is a Class C drift mine, located 1,600 feet above sea level, in Cumberland Mountain, $\frac{1}{4}$ mile from Clifty, and connects with N., C. & St. L. Railroad. The Sewanee seam, having an average thickness of 46 inches, is worked. The roof is shale and the

bottom fire clay. It is developed on the double entry system. Ventilation is produced by furnace, with a grate area of 50 feet, and is distributed by the split system. Haulage is conducted from rooms to mine entrance, a distance of 1,200 feet, by mules, and from mine entrance to tipple a distance of 600 feet, by mules.

WHITE COUNTY.

Eastland No. 1 Mine—Owner and Operator, Bon Air Coal & Iron Co., Nashville; President, John P. Williams, Nashville; Secretary, C. Cooper, Nashville; Inside Foreman, George Thom, Sr., Eastland.

This is a Class B drift mine, located 1,800 feet above sea level, in Cumberland Mountain, at Eastland, and connects with N., C. & St. L. Railroad. The Sewanee seam, having an average thickness of 48 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the double entry, room and pillar system. Ventilation is produced by fan, with a diameter of 18 feet, and is distributed by the split system. Haulage is conducted from rooms to sidetrack by mules, and from sidetrack to mine entrance by mules. Length of main entry, 2,800 feet.

WHITE COUNTY.

Eastland No. 2 Mine—Owner and Operator, Bon Air Coal & Iron Co., Nashville; President, John P. Williams, Nashville; Secretary, A. Cooper, Nashville; Inside Foreman, George Thomas, Sr., Eastland.

This is a Class B drift mine, located 1,800 feet above sea level, in Cumberland Mountain, at Eastland, and connects with N., C. & St. L. Railroad. The Sewanee seam, having an average thickness of 48 inches, is worked. The roof is slate and the bottom fire clay. It is developed on the single entry, room and pillar system. Ventilation is produced by fan, with a diameter of 18 feet, and is distributed by the split system. Haulage is conducted from rooms to sidetrack, a distance of — feet, by mules, and from sidetrack to mine entrance, a distance of — feet, by tail rope. Length of main entry, 600 feet.

WHITE COUNTY.

Ravenscroft Mine—Owner and Operator, Bon Air Coal & Iron Co., Nashville; President, John P. Williams, Nashville; Secretary, C. Cooper, Nashville; Inside Foreman, James Cope, Ravenscroft.

This is a Class C shaft mine, 182 feet in depth, and located 1,800 feet above sea level, in Cumberland Mountain, at Ravenscroft, and connects with N., C. & St. L. Railroad. The Ravenscroft seam, having an average thickness of 54 inches, is worked. The roof is sandstone and the bottom fire clay. It is developed on the double entry system. Ventilation is produced by fan, with a diameter of 10 feet, and is distributed by the split system. Haulage is conducted from rooms to sidetrack, an average distance of 1,230 feet, by mules, and from sidetrack to cage, an average distance of 1,250 feet, by tail rope.

BARYTES

The following statement shows total product and value of barytes produced in Tennessee in 1909, by counties, compared with 1908:

Barytes product and value in Tennessee in 1909, compared with 1908.

COUNTY	1909						1908		Increase + or Decrease -	
	EMPLOYES			PRODUCT			PRODUCT		Product (Short Tons)	Value
	Average Number	Av. Wages Paid Per Day	Total Wages Paid	Quantity (Short Tons)	Value	Value Per Ton	Quantity (Short Tons)	Value		
Loudon.....	4	-----	-----	400	\$ 600	\$ 1.50	728	\$ 1,260	— 328	— \$ 660
McMinn.....	6	-----	-----	1,000	1,500	1.50	2,400	4,200	— 1,400	— 2,700
Monroe.....	10	-----	-----	3,231	4,846	1.50	5,521	11,615	— 2,290	— 6,769
Total.....	20	\$1.00	\$4,700	4,631	\$6,946	\$ 1.50	8,649	\$ 17,075	— 4,018	— \$10,129

There are valuable deposits containing reserves in the counties of Cocke, Jefferson and Sevier. The production of barytes in the United States in 1908 amounted to 38,527 short tons, valued at \$120,442.

IMPORTS.

The barytes and barium compounds imported and entered for consumption in the United States in 1909 are as follows:

	Quantity	Value
Manufactured barytes (short tons).....	2,692	\$ 25,679
Unmanufactured barytes (short tons).....	10,398	29,028
Total.....	13,090	\$ 54,707
Barium Compounds:		Value
Barium binocide.....		\$ 255,013
Blanc fixe or artificial Sulphate of barytes and satin white and artificial sulphate of lime.....		65,427
Witherite.....		31,584
Total.....		\$ 406,731

CHARACTER AND USES.

Barytes, or heavy spar, is barium sulphate (BaSO_4), and is composed of barium minoxide 65.7 per cent, and sulphur trioxide 34.3 per cent. The specific gravity is 4.3 to 4.6 per cent, and the hardness 2.5 to 3.5 per cent. By nature, barytes is rarely pure, the most common impurities being lime, magnesia, silica and the oxides of iron and aluminum. One of the principal uses is, as a white pigment, on account of its weight, absence of color and inertness. It is not fitted for such use, however, until the extraction by milling of all associated minerals, such as clay, calcium, carbonate, silica iron oxide, manganese oxide, lead and zinc. It is also used as a base for conveying many organic coloring matters used in paints. Other uses are in sugar refining, enameling iron, oil cloths and paper collars; in the manufacture of paper, cloth, rubber, lithophone, and in the manufacture of barium salts, and as an adulterant. The Tennessee product is practically all used for manufacturing purposes. The only mill in Tennessee for refining crude barytes is owned by the W. D. Gilman Co., at Sweetwater, which refined 1,500 tons during 1909.

CEMENT

The Dixie-Portland Cement Company, located at Richard City, in Marion County, with main office at South Pittsburg, is the only active cement plant in Tennessee. This company began work November 1, 1907. The result of 1909 operations is as follows:

Average number of employes	250
Average wages paid per day	\$1 50
Total amount paid for labor	\$175,000
Total quantity Portland cement produced (bbls.)	600,000
Total value of product	\$480,000
Yield of limestone in cement (per cent)	75.00
Coal used for fuel (short tons)	75,000
Clay or shale used (short tons)	55,000

The plant has three kilns in use, 8x110 feet each.

UNITED STATES PRODUCTION.

The total production of cement in the United States in 1908 amounted to 52,919,520 barrels, valued at \$44,481,641, or 84 cents per barrel. Of this amount, 51,072,612 barrels, valued at \$43,547,679, is Portland cement; 1,686,862 barrels, valued at \$834,509, is natural cement and 160,046 barrels, valued at \$99,453, is Puzzolan or Slag cement, which is made by mixing blast furnace slag with slaked lime.

PORTLAND CEMENT IN THE UNITED STATES BY STATES.

The following table gives the total Portland cement production in the United States by States in 1908:

Production of Portland cement in the United States in 1908, by States.

STATE	Produc- ing Plants	Quantity (Barrels)	Value
Pennsylvania	17	18,254,806	\$ 13,899,807
Indiana	7	6,478,165	5,386,563
Kansas	7	3,854,603	2,874,457
Illinois	5	3,211,168	2,707,044
New Jersey	3	3,208,446	2,416,009
Missouri	4	2,929,504	2,571,236
Michigan	15	2,892,576	2,556,215
{ California	4	{ 2,480,100	{ 3,268,196
{ Washington	2		
New York	7	1,988,874	1,813,623
Ohio	8	1,521,764	1,305,210
{ Iowa	1	{ 1,205,251	{ 1,176,499
{ Kentucky	1		
{ Tennessee	1		
Texas	2	{ 917,977	{ 924,039
Oklahoma	2		
South Dakota	1	{ 809,306	{ 1,057,433
Colorado	2		
Arizona	1	{ 507,603	{ 805,235
Utah	2		
Maryland	1	{ 502,225	{ 511,118
Virginia	1		
Massachusetts	1		
Alabama	2	{ 310,244	{ 274,995
Georgia	1		
Total	98	51,072,612	\$ 43,547,679

RAW MATERIALS.

Portland cement is produced by burning a finely ground artificial mixture consisting essentially of lime silica, alumina and iron oxide, in certain definite proportions. Usually this combination is made by mixing limestone or marl with clay or shale, in which case about three times as much of the lime carbonate should be present in the mixture as of the clayey materials. The burning takes place at a high temperature, approaching 3,000 degrees F., and must therefore be carried on in kilns of special design and lining. During the burning, combination of the lime with silica, alumina and iron oxide takes place. The product of the burning is a semi-fused mass called clinker, and consists of silicates, aluminates and ferrites of lime in certain definite proportions. This clinker must be finely ground. After such grinding the resulting powder is Portland cement. The finished product is blue to gray in color, has a specific gravity of 3 to 3.25, and when mixed with water will harden or set.

The product must be uniform in composition and quality; and as the processes of manufacture involve certain chemical as well as physical changes, four points may be regarded as of cardinal importance in making Portland cement. These are:

1. The cement mixture must be of the proper chemical and physical composition.
2. The raw materials of which it is composed must be finely ground, and intimately mixed before burning.
3. The burning must be conducted at the proper temperature.
4. After burning the resulting clinker must be finely ground.

A Portland-cement mixture, when ready for burning, will consist of about 75 per cent of lime carbonate (CaCO_3) and 20 per cent of silica (SiO_2), alumina (Al_2O_3) and iron oxide (Fe_2O_3) together, the remaining 5 per cent, including any magnesium carbonate, sulphur, and alkali that may be present.

VALUATION OF DEPOSITS OF CEMENT MATERIALS.

The value of a deposit of raw material for Portland cement manufacture depends upon a number of distinct factors, the more important of which are as follows:

1. Chemical composition of the material.
2. Physical character of the material.
3. Amount of material available.
4. Location of the deposit with respect to transportation routes.
5. Location of the deposit with relation to fuel supplies.
6. Location of the deposit with respect to markets.

The characteristics of a deposit necessary for the manufacture of a good Portland cement may be briefly stated as follows: The raw material must be of correct chemical composition for use as a cement material. This implies that the material, if a limestone, must contain as small a percentage as possible of magnesium carbonate. Under present conditions 5 or 6 per cent of magnesium carbonate is the maximum permissible. Free silica in the form of chert, flint or sand must be absent, or present only in small quantities, say 1 per cent or less. If the limestone is a clayey limestone or "cement rock," the proportion between its silica and its alumina and iron should fall within the limits.

$$\frac{\text{SiO}_2}{\text{Al}_2\text{O}_3 + \text{Fe}_2\text{O}_3} > 2. \quad \text{and} \quad \frac{\text{SiO}_2}{\text{Al}_2\text{O}_3 + \text{Fe}_2\text{O}_3} < 3.5$$

A clay or shale should satisfy the above equation, and should be free from sand, gravel, etc. Alkalies and sulphates should, if present, not exceed 3 per cent or so.

The nearer a limestone approaches in composition to the mixture used in Portland cement manufacture the greater its value for that purpose, for it will require the addition of less extraneous material to make the mixture absolutely correct in composition. The following are analyses of Portland cement mixtures, ready for burning, as used at various large cement plants in the United States:

Analysis of Portland cement mixtures (per cent).

	1	2	3	4
Silica (SiO_2) -----	12.85	12.92	13.52	14.94
Alumina (AL_2O_3) -----	4.92	4.83	6.56	2.66
Iron oxide (Fe_2O_3) -----	1.21	1.77	-----	1.10
Lime Carbonate (CaCO_3) -----	76.36	75.53	75.13	75.59
Magnesium carbonate (MgCO_3) -----	2.13	4.34	4.32	4.64

It will be seen that the usual mixtures carry from 75 to 77 per cent of lime carbonate. If rock of this composition occurs in sufficient quantity it would require but little admixture of other materials to keep the cement correct in composition.

IMPORTS AND EXPORTS IN 1909.

The cement imported and entered for consumption in the United States in 1909 amounted to 172,713,895 pounds, valued at \$642,397. The exports of hydraulic cement from the United States in 1909 amounted to 1,056,922 barrels, valued at \$1,417,534.

NEW USES FOR CEMENT.

White, non-staining Portland cement is now being manufactured for ornamental and surface work for both interior and exterior purposes. The material suitable for its manufacture must be selected with much care. Silica and alumina must be properly proportioned, and iron oxide must not be present in excess of 0.2 per cent in the finished product. Limestone and clay, low in iron oxide, are necessary in the manufacture of a colorless cement.

Cement is now being used on cornices to replace wood and metal on brick and stone structures, as well as on concrete houses. Handsome mantels, friezes and cornices are being successfully made of it, and separate pieces, such as statuary, urns, lamps, vases, pedestals, tables, seats, and other classes of sculptural and ornamental work can be produced.

A great deal of cement is used at present in paving, in concrete bases or foundations for granite block, brick, creosoted block and asphalt pavements. When protected from direct exposure, surfaced with another material, the concrete foundations give satisfaction. It is difficult however, to avoid contraction cracks, even when the pavement is divided into large blocks by means of joints. For this reason more satisfactory method of construction or treatment must be devised by which concrete can be used as a wearing surface for roads.

CLAY

The following statement gives classified product of clay mined and sold in Tennessee in 1909:

Clay mined and sold in Tennessee in 1909 (short tons).

COUNTY	Total Number of Employees	CHARACTER OF CLAY MINED AND SOLD								Total
		Ball Clay	Fire Clay	Kaolin	Saggar Clay	Stoneware Clay	Wad Clay	Wood and Fiber Clay	Miscellaneous Clay	
Hamilton	2		10							10
Hardeman	7					223				223
Henry	136	16,993	7,122		940	1,500	6,080		700	33,335
James	5							625		625
Knox	3			225						225
Madison	5		230							230
Putnam	4					48				48
Rhea	20					9,250				9,250
Weakley	1					15				15
Total	183	16,993	7,362	225	940	11,036	6,080	625	700	43,961

RECAPITULATION

Total number of employees	183
Average wages paid per day	\$ 1.30
Total amount paid for labor	\$ 44,317

PRODUCT AND VALUES

CHARACTER OF CLAY	Product Short Tons	Value
Ball clay	16,993	\$ 50,735
Fire clay	7,362	9,847
Kaolin	225	281
Saggar clay	940	1,640
Stoneware clay	11,036	12,886
Wad clay	6,080	7,460
Wood and fiber clay	625	937
Miscellaneous clay	700	1,250
Total	43,961	\$ 85,036

The clay given above is only such as is mined and sold as clay by the miner, and does not embrace the clay burned into brick, tiling or pottery by the parties mining it.

Tennessee has quite an extensive area of valuable clay deposits, practically covering the entire State. When burnt and prepared for the market all colors are represented, blue, buff, gray, red, terra cotta, white, etc. The most important and variegated clay deposits now under development are located in Henry County. The ball clay produced is shipped to Kentucky, Indiana, Missouri, New Jersey, New York, Ohio, Pennsylvania and West Virginia.

CLASSIFICATION OF TENNESSEE CLAYS—BY USES.

The Kaolin and ball clays are used in the manufacture of white tableware, sanitary ware, high grade tiling and electric porcelain. The refractory are the fire and plastic

clays used in the manufacture of fire brick, gas retorts, crucibles, etc. The pottery clay is used in the manufacture of stoneware, such as jugs, churns, jars, urns, jardinières, pitchers, sewer pipe, etc.

The saggar clay is used for making saggars, in which the ware is burnt, and the wad clay is used for making wads, which are applied between the saggars, stacking them up in kilns. The slip clays are of low fusibility and are used to glaze clay wares.

CHEMICAL PROPERTIES OF CLAY.

The chemical elements composing the minerals in clay are: Oxygen, silicon, aluminium, iron, calcium, magnesium, sodium, hydrogen, titanium, potassium, carbon and sulphur. The last two elements may occur as simple elementary substances uncombined. The other elements are combined to form such compounds as lime, water and silica.

CHEMICAL COMPONENTS OF CLAY

Component	Chemical Symbol	Component	Chemical Symbol
Silica	SiO_2	Soda	Na_2O
Alumina	Al_2O_3	Titanic Acid	TiO_2
Ferric Oxide	Fe_2O_3	Sulphur Trioxide	SO_3
Lime	CaO	Carbon dioxide	CO_2
Magnesia	MgO	Water	H_2O
Potash	K_2O		

Iron, lime, magnesia, potash and soda are classed as fluxing impurities. In clay the lime is usually combined with carbon dioxide (CO_2), to form calcium carbonate (CaCO_3), or with water and sulphur trioxide to form hydrous sulphate of lime or gypsum.

The determination of the percentage of the different mineral compounds in the clay is called its rational analysis, which may be computed from the ultimate analysis, and is useful in making clay mixtures.

The analyses of clays submitted are all from Henry County. An analysis of one sample is as follows:

CHEMICAL ANALYSES.

Chemical Properties	Per Cent	Chemical Properties	Per Cent
Silica	48.94	Magnesia	0.71
Alumina	36.69	Potash	0.88
Oxide of iron	0.35	Soda	0.40
Lime	0.47	Loss on ignition	12.14
		Total	100.58

This analysis is close to that of Kaolin, of which the theoretical proportions are: Silica, 46.30 per cent; alumina, 39.90 per cent; water, 13.80 per cent.

Shrinkage in drying amounted to 8 per cent, does not crack or warp, and burns to a dense vitreous, practically non-absorbent, and exceedingly hard, strong body when carried up the temperature of its best vitrification.

Other analyses are as follows:

No. 1 Tenn. Ball Clay. Ultimate analysis.		No. 3 Tenn. Ball Clay. Ultimate Analysis.	
Chemical Properties.	Per Cent.	Chemical Properties.	Per Cent.
Volatile	13.94	Volatile	14.16
Silica	47.26	Silica	48.72
Alumina	35.85	Alumina	32.89
Iron Oxide	1.01	Iron Oxide	2.25
Calcium	0.58	Calcium	0.60
Magnesium	0.68	Magnesium	0.65
Potassium	0.74	Potassium	0.98
Sodium	0.45	Sodium	0.14
Rational Analysis.		Rational Analysis.	
Clay Substance	93.04	Clay Substance	89.04
Silica	6.17	Silica	9.64
Feldspar	0.79	Feldspar	1.32

The No. 1 clay soaks readily in water and will pass through a No. 12 lawn leaving but little residue. It is very plastic and will stand a great deal of handling, when moulded, its tensile strength being about the same as the English ball clay. It will carry 65 per cent of non-plastic material. When fired to cone 8 it shows a total shrinkage of 15 per cent, at which heat it burns to a clear dense body of excellent color.

The No. 3 clay soaks readily and on sifting through a No. 12 lawn leaves a residue of from 10 to 15 per cent, consisting mainly of fine grained sand. The sifting removes a great proportion of the iron found in the crude clay, it being in the form of iron pyrites. It is extremely plastic and will carry as high as 72 per cent of flint, and is nearly an exact counterpart of the English ball clays. When fired its shrinkage at cone 1, is 12.5 per cent, and at cone 8, 18 per cent, at which heat it burns to a dense, vitrified body of a grayish white color.

The following is the analysis of No. 7 Tennessee ball clay. Ultimate analysis:

Chemical Properties.	Per Cent.	Chemical Properties.	Per Cent.
Volatile.....	10.92	Potassium.....	.59
Silica.....	53.57	Sodium.....	.21
Alumina.....	32.82	(RATIONAL ANALYSIS.)	
Iron Oxide.....	1.31	Clay Substance.....	83.39
Calcium.....	.62	Silica.....	14.78
Magnesium.....	.38	Feldspar.....	1.83

This analysis was taken from an unwashed sample and determination of iron on the same clay after washing and sifting through a No. 12 lawn shows a considerable decrease in iron oxide, leaving a residue of less than 1 per cent. At cone 8 it burns to a dense and practically non-absorbent body, showing a shrinkage of 14 per cent.

This clay is being used extensively by white ware potters and tile manufacturers as a substitute for English ball clay.

The following is the analysis of wad and saggar clays:

MONROE WAD CLAY.

(ULTIMATE ANALYSIS.)

Chemical Properties.	Per Cent.
Volatile.....	8.80
Silica.....	61.02
Alumina.....	26.32
Iron Oxide.....	1.58
Calcium.....	.69
Magnesium.....	.83
Potassium.....	.65
Sodium.....	.18

(RATIONAL ANALYSIS.)

Clay Substance.....	49.67
Silica.....	45.79
Feldspar.....	4.54

SAGGAR CLAY.

(ULTIMATE ANALYSIS.)

Chemical Properties.	Per Cent.
Volatile.....	8.38
Silica.....	63.54
Alumina.....	24.42
Iron Oxide.....	1.22
Calcium.....	.72
Magnesium.....	.63
Potassium.....	1.24
Sodium.....	.23

(RATIONAL ANALYSIS.)

Clay Substance.....	62.94
Silica.....	34.36
Feldspar.....	2.70

CLAY PRODUCTS—BRICK, TILING, SEWER PIPE, Etc.

The following table gives number of employes, classified brick product by counties, and total value of all brick, flue goods, sewer pipe, tiling and other similar products in Tennessee in 1909:

Brick, tiling, sewer pipe and kindred products in Tennessee in 1909.

COUNTY	Total Number of Employes	QUANTITY (Thousands)					Total Value of all Brick, Drain Tile, etc.
		Common Brick	Vitrified Paving Brick	Front Brick	Fancy or Or- namental Brick	Fire Brick	
Bedford	2	100					\$ 650
Blount	40	6,074		8			35,408
Bradley	8	500		30			3,800
Carroll	25	1,200					6,000
Carter	18	1,300					7,250
Cocke	8	200					1,600
Coffee	24	500		20			3,650
Davidson	265	27,586	2,000	5,921			221,561
Dekalb	18	190		40			1,910
Dyer	18	1,800					10,800
Franklin	10	400					2800
Gibson	45	2,255					14,790
Greene	36	497					13,810
Hamblen	16	275				50	2,200
Hamilton	351	30,000		989		500	24,9614
Hardeman	30	1,000					6,500
Haywood	10	1,000					7,000
Henderson	5	35					245
Henry	15	1,000					6,500
Jefferson	10	400					2,000
Knox	159	21,637		2,091	5	103	140,793
Lauderdale	12	430					3,140
Lawrence	5	489					2,942
Madison	75	2,871		409		948	35,999
Marshall	8	250					1,500
Maury	32	1,300					6,800
Monroe	15	250					1,500
Montgomery	25	1,100					6,600
Obion	95	3,440					42,540
Putnam	17	1,170					7,230
Robertson	10	600					3,600
Rutherford	22	650					9,000
Scott	154		11,331				122,379
Sevier	25	715		6			4,696
Shelby	265	29,058					172,886
Sumner	12	340					2,300
Tipton	15	900					6,750
Warren	10	300					1,500
Weakley	19	1,300					8,200
White	10	260					2,600
Total	1,939	143,372	13,331	9,514	5	1,601	\$1,181,043

RECAPITULATION.

Total average number of employes	1,939
Average wages paid per day	\$1 10
Total amount paid for labor	\$521,085

CLASSIFIED QUANTITY AND VALUE OF PRODUCT.

CHARACTER OF PRODUCT	Quantity	Value	Value per 1,000
Common Brick.....	143,372,000	\$ 790,676	\$ 5.51
Vitrified paving brick.....	13,331,000	144,143	10.81
Front brick.....	9,514,000	93,679	9.84
Fancy or ornamental brick.....	5,000	195	39.00
Fire brick.....	1,601,000	20,491	12.80
Total.....	167,823,000	\$ 1,049,184	\$ 6.25
Drain tile.....		46,859	
Sewer pipe.....		80,000	
Hollow building tile and blocks.....		5,000	
Grand total value.....		\$ 1,181,043	

POTTERY

The following table gives total average number of employees, and classified value of pottery products in Tennessee in 1909 by counties:

Employees and classified value of pottery products in Tennessee in 1909.

COUNTY	Total Average No. of Employees	Red Earth-ware	Stoneware	Turpentine Cups	Total Value	Total Kilns in Use
Carroll.....	3	\$ 250	\$ 1,200		\$ 1,450	
Davidson.....	35		32,500		32,500	
Hamilton.....	55			47,000	47,000	
Hardeman.....	8		3,040		3,040	
Madison.....	12	90	1,660		1,750	
Putnam.....	4		450		450	
Total.....	117	\$ 340	\$ 38,850	\$ 47,000	\$ 86,190	18

RECAPITULATION.

Total average number of employees	117
Average wages paid per day	\$1 35
Total amount paid for labor.....	\$15,880

IMPORTS AND EXPORTS.

The following statement gives imports and exports of brick and other clay products in 1909:

KIND OF PRODUCT	Import Value	Export Value
Brown Earthenware and Stoneware.....	\$ 1,150,047	\$ 776,842
China and Porcelain (decorated).....	9,000,202	86,853
All other.....	198,604	
Total Pottery.....	\$ 10,348,853	\$ 863,695
Brick—(building), tile, etc.....	194,025	147,622
Bricks (all other).....		1,002,270
Grand total.....	\$ 10,542,878	\$ 2,013,587

COKE

The term "coke" as herein used is limited to that product obtained by the distillation or partial combustion of bituminous coal in retorts or ovens.

In Tennessee the beehive oven is exclusively used, the name being derived from the shape or design of the combustion chamber, which is similar to that of the conventional beehive. There are 16 coking establishments now in Tennessee, with a total of 2,700 ovens. Of the total number of ovens in existence during 1909, there were 1,615, idle during the entire year, leaving 1,085 active ovens, which produced 262,750 short tons of coke, or an average yield of 242 short tons per oven.

The coke-producing counties in 1909 were Campbell, Grundy, Hamilton, Marion, Morgan, Rhea, Roane and Sequatchie, a total of eight.

PRODUCTION.

The total coke output in Tennessee in 1909 amounted to 262,750 short tons, valued at \$669,547, or \$2.55 per ton. As compared with 1908, this is an increase in product of 44,014 short tons or 20.11 per cent, and an increase in value of \$97,527, or 17.05 per cent.

As to rank of producing counties, Roane still leads, with Rhea second and Morgan third. Hamilton has taken fourth position from Marion.

CONDITION IN WHICH COAL IS CHARGED INTO THE OVENS.

There were 507,359 short tons of coal used in coke manufacture, and all but 48,468 short tons or 9.55 per cent was washed before being charged into the ovens. Of the 90.45 per cent of coal washed before being charged into the ovens, 167,748 short tons or 36.55 was washed run of mines, and 291,143 short tons, or 53.90 per cent, was washed slack. Crushing and washing the coal greatly facilitates the coking process and produces a much better quality of coke. Of the coal coked, 167,748 short tons, or 33.06 per cent, was run of mines, and 339,611 short tons, or 66.94 per cent, was slack.

DISPOSITION OF PRODUCT.

The producing companies used 153,521 short tons in the manufacture of pig iron at a valuation of \$427,772, or \$2.72 per ton, and sold 107,556 short tons for \$231,102, or \$2.15 per ton. The State of Tennessee produced 50,329 short tons at Brushy Mountain, which sold for \$82,439, or \$1.63 per ton. Eliminating the State operations, the coke sold amounted to 57,227 short tons, which brought \$148,663, or \$2.60 per ton. It will thus be observed that the commercial rate per ton for the State was \$2.60. Excluding the State operations, the rate received by the State was only \$1.63.

The values for Rhea, Roane and Sequatchie counties are based upon the imported cost of production, while the values for Campbell, Grundy, Hamilton, Marion and Morgan are based upon the reported commercial rate received per ton.

QUANTITY AND VALUE OF COAL USED IN COKE MANUFACTURE.

Excluding the operations of the State at Brushy Mountain mines in Morgan County, the quantity and value of coal used in coke manufacture are as follows:

Total Coal used in Coke Manufacture (short tons)	406,666
Total value of Coal used in Coke Manufacture	\$ 466,859
Value per ton of Coal used	1.15
Quantity of Coal used per ton of Coke product (short tons)	1.91
Total value of Coal in a ton of Coke	\$ 2.19

COST OF COKE PRODUCT.

Excluding the operations of the State at Brushy Mountain, which constitutes the figures for Morgan County, the cost of coke product manufactured in 1909 is as follows:

	Total Cost	Per cent of total cost
Coal Coked.....	\$ 466,859	80.60
Labor.....	78,652	13.60
All other expenses.....	33,729	5.80
Total cost of Coke.....	\$ 579,240	100.00

Calculating the cost on a tonnage basis, the cost of coke per ton is: Coal, \$2.19; labor, 0.37c; and other expenses, 0.16c, making total cost of coke per ton of \$2.72.

The reported cost per ton of coke at the State's plant at Brushy Mountain, not including the cost to maintain the laborers engaged in the work, which is not given, is as follows: Coal, 0.752c; other expenses, 0.266c, making a total cost per ton of \$1.018, exclusive of the cost per ton for labor.

ANALYSES.

The latest analyses given by the producing companies of coke manufactured in Tennessee are as follows:

Coke analyses in Tennessee, 1909.

NAME OF WORKS	ANALYSIS (Per Cent)				
	Fixed Carbon	Volatile Matter	Ash	Moisture	Sulphur
La Follette.....	86.359	1.744	11.085	0.156	0.656
Coalmount.....	85.78	0.39	13.44	0.39	0.61
Soddy.....	82.30	2.32	14.62	-----	0.76
Whitwell.....	86.09	0.71	12.46	0.74	0.84
Brushy Mountain.....	87.90	0.194	10.16	0.20	1.55
Nelson (Dayton).....	83.06	-----	14.70	1.30	0.63
Richland (Dayton).....	82.01	-----	16.07	1.10	0.52
Fox.....	84.04	0.57	15.14	0.25	0.807
Roane.....	83.69	2.58	13.73	-----	0.56
Southern.....	83.77	1.53	14.70	-----	0.913
Eastland.....	82.10	1.06	14.16	0.32	2.36

COKE MAKING IN BY-PRODUCT OVENS.

The statistics show that there has been a steady and constant increase in the construction of the by-product coke oven in the United States. Beginning with twelve Semet-Salvoy ovens at Syracuse in New York in 1893, the initial year of construction, there were 4,007 built at the close of 1908. This is an increase of 115 as compared with 1907, and consists of 1,270 Semet-Salvoy, 2,002 United Otto, 387 Rothberg, 208 Newton-Chambers, and 140 Koppers regenerative ovens. The Koppers' ovens were constructed in 1907 and 1908 by the Illinois Steel Co., at Joliet, Ill.

The entire coke product of Tennessee is still manufactured in the beehive oven, notwithstanding the fact that the by-product oven furnishes an increased output per oven of coke, and a constant and steady increasing yield of coal in coke, as well as an appreciative increase in the prices per ton obtained for the manufactured product.

There were 4,007 by-product coke ovens active in the United States in 1908, which produced 4,201,226 short tons of coke, or 1,043 tons for each oven, while the average yield of the beehive oven only amounted to 257 short tons. The average price ob-

tained for the beehive coke was \$2.40 per ton, while the average price obtained for the by-product coke was \$3.44.

The yield of coal in coke in the beehive ovens for the United States during 1908 was 66 per cent, as against 65.8 per cent in 1907.

The yield of coal in coke in the by-product oven for the United States during 1908 was 73.7 per cent, as against 75 per cent in 1907, and 73.6 per cent in 1906.

The excess in the yield of coal in coke, shown by the by-product oven, as compared with the beehive oven is due to the exclusion of air in the retort oven process while the coal is being distilled and the fixed carbon remaining as coke, while in the beehive oven practice some of the fixed carbon is unavoidably burned.

It will be observed from tables 6 and 7 that the yield of coal in coke for the United States has increased since 1880 from 63 per cent to 66 per cent in 1908, and that the yield for Tennessee has steadily decreased from 60 per cent in 1880 to 51.78 per cent in 1909. The increase in the average yield of coal in coke for the United States is due to the increase of coke manufacture in the by-product oven.

In addition to the economy shown in the higher yield of coal in coke, as well as the higher prices obtained for the coke manufactured in the retort oven, the value of the by-products obtained in its manufacture adds materially to the earning capacity of the plant. In 1908 the total value of coke made in retort ovens was \$14,465,429, while the value of the by-products amounted to \$7,382,299, or more than 50 per cent, as follows:

Gas (in cubic feet)	16,205,925	value	\$2,557,483
Tar (gallons)	42,720,609	value	1,007,613
Ammonia sulphate, or reduced to equivalent in sulphate (pounds)	43,729,426	value	1,286,224
Anhydrous ammonia (pounds)	15,445,030	value	2,530,979
Total value			<u>\$7,382,299</u>

The by-product gas is surplus gas not consumed in the coking process and is either sold or used at the plant.

IMPORTS AND EXPORTS.

The coke imports in 1909 amounted to 170,671 short tons, valued at \$735,253, while the coke exports in 1909 amounted to 895,461 short tons, valued at \$3,232,673.

The following series of six tables in reference to coke manufacture in Tennessee, and table No. 7 in reference to coke manufacture in the United States, will be found interesting:

TABLE No. 1—Shows operators of coke plants, arranged alphabetically by counties, also name of coke works in Tennessee in 1909.

Coke manufacturers and coke works in Tennessee in 1909.

COKE MANUFACTURERS			COKE WORKS	
No.	COUNTY AND NAME	POSTOFFICE	COUNTY AND NAME	POSTOFFICE
1	<i>Campbell County.</i> LaFollette Coal, I. & R. R. Co.	LaFollette	<i>Campbell County.</i> LaFollette	LaFollette.
2	<i>Claiborne County.</i> Mingo Coal & Coke Co.	Middlesboro, Ky.	<i>Claiborne County.</i> aMingo	Hartranft.
3	<i>Cumberland County.</i> Waldensia Coal & Coke Co.	Waldensia	<i>Cumberland County.</i> aWaldensia	Waldensia.
4	<i>Grundy County.</i> Tenn. Con. Coal Co.	Tracy City	<i>Grundy County.</i> aBryant Ridge	Tracy City.
5	<i>Hamilton County.</i> Sewanee Fuel & Iron Co.	Coalmont	<i>Hamilton County.</i> Coalmont	Coalmont.
6	<i>Marion County.</i> New Soddy Coal Co.	Chattanooga	<i>Marion County.</i> Soddy	Soddy.
7	<i>Marion County.</i> New Etna Coal Co.	Chattanooga	<i>Marion County.</i> aEtna	Whitesides.
8	<i>Tenn. Coal, I. & R. R. Co.</i>	Birmingham, Ala.	<i>Tenn. Coal, I. & R. R. Co.</i>	Victoria.
9	<i>Tenn. Coal, I. & R. R. Co.</i>	Birmingham, Ala.	<i>Tenn. Coal, I. & R. R. Co.</i>	Whitwell.
10	<i>Morgan County.</i> State of Tennessee	Nashville	<i>Morgan County.</i> Brushy Mountain	Petros.
11	<i>Rhea County.</i> Dayton Coal & Iron Co.	Dayton	<i>Rhea County.</i> aNelson	Dayton.
12	<i>Dayton Coal & Iron Co.</i>	Dayton	<i>Dayton Coal & Iron Co.</i>	Dayton.
13	<i>Fox Coal Co.</i>	Graysville	<i>Fox Coal Co.</i>	Graysville.
14	<i>Roane County.</i> Roane Iron Co.	Rockwood	<i>Roane County.</i> Roane Iron	Rockwood.
15	<i>Sequatchie County.</i> Southern Steel Co.	Birmingham, Ala.	<i>Sequatchie County.</i> Southern	Dunlap.
16	<i>White County.</i> Bon Air Coal & Iron Co.	Nashville	<i>White County.</i> aEastland	Eastland.

a—Not active.

TABLE No. 2—Shows number of coking establishments, number and character of coke ovens now built, number of ovens in process of building, number of ovens in blast during the year, and value of coke works in Tennessee in 1909.

Coke ovens and coke works in Tennessee in 1909.

COUNTY	Number of Establishments	OVENS			VALUE OF WORKS		
		Built	Building	In Blast During Year	Plant	Machinery and Improvements	TOTAL
Campbell	1	293		26	\$ 165,000	\$ 40,000	\$ 205,000
Claiborne	1	173			31,200	4,960	36,160
Cumberland	1	60			11,000	10,000	21,000
Grundy	2	380		60	75,600	13,500	89,100
Hamilton	1	192		146	32,800	11,445	44,245
Marion	3	275	15	160	34,500	3,950	38,450
Morgan	1	140		139	32,500	7,500	40,000
Rhea	3	449		166	86,300	22,100	108,400
Roane	1	370		220	12,000	10,000	22,000
Sequatchie	1	168		168	45,000	9,000	54,000
White	1	200			156,586	10,000	166,586
Total	16	2,700	15	1,085	\$ 682,486	\$ 142,455	\$ 824,941

Note—All ovens are of the bee-hive type.

TABLE No. 3—Shows number of employees, average wages paid per day, total wages paid, average number of days active, and character and quantity of coal coked by coke works in Tennessee in 1909.

Employees and wages and character of coal coked in Tennessee in 1909.

COUNTY	EMPLOYEES			CHARACTER OF COAL COKED (Short Tons)				
	Total Number	Average Wages Paid Per Day	Total Amount Paid for Labor	RUN OF MINE		SLACK		TOTAL
				Un- washed	Washed	Un- washed	Washed	
Campbell	16						10, 089	10, 089
Claiborne								
Cumberland								
Grundy	20					18, 107		18, 107
Hamilton	38						55, 550	55, 550
Marion	44					30, 361		30, 361
Morgan	48						100, 693	100, 693
Rhea	60						109, 285	109, 285
Roane	130				167, 748			167, 748
Sequatchie	50						15, 526	15, 526
White								
Total	406	\$ 1. 20	\$ 78, 652		167, 748	48, 468	291, 143	507, 359

TABLE No. 4—Shows quantity of coal used in the manufacture of coke, yield of coal in coke (per cent), and value of coke produced at coke works in Tennessee in 1909.

Coal coked, yield of coal in coke and quantity and value of coke produced in Tennessee in 1909.

COUNTY	Coal Used (Short Tons)	Yield of Coal in Coke (Per Cent)	COKE PRODUCT		
			Quantity (Short Tons)	Value	Value Per Ton
Campbell.....	10,089	35.74	3,609	\$ 7,218	\$ 2.00
Claiborne.....					
Cumberland.....					
Grundy.....	18,107	45.95	8,317	22,060	2.65
Hamilton.....	55,550	54.00	30,150	82,009	2.72
Marion.....	30,361	55.40	16,824	48,049	2.85
Morgan.....	100,693	50.00	50,329	82,439	1.63
Rhea.....	109,285	56.14	61,360	168,897	2.75
Roane.....	167,748	50.00	83,876	236,092	2.80
Sequatchie.....	15,526	53.00	8,285	22,783	2.75
White.....					
Total.....	507,359	51.78	262,750	\$ 669,547	\$ 2.55

TABLE No. 5—Shows quantity and value of coal used in the manufacture of coke and quantity and value of coal per ton of coke at Tennessee coke works in 1909.

Quantity and value of coal used, and quantity and value of coal per ton of coke in 1909.

COUNTY	Coal Used (Short Tons)	Total Value of Coal Used	Value of Coal Per Ton	Quantity of Coal Per Ton of Coke (Short Tons)	Value of Coal in a Ton of Coke
Campbell.....	10,089	\$ 5,044	\$ 0.50	2.80	\$ 1.40
Claiborne.....					
Cumberland.....					
Grundy.....	18,107	16,296	0.90	2.17	1.95
Hamilton.....	55,550	66,660	1.20	1.84	2.20
Marion.....	30,361	34,692	1.14	1.80	2.05
Morgan.....	100,693	75,796	0.753	2.00	1.506
Rhea.....	109,285	134,152	1.22	1.78	2.17
Roane.....	167,748	191,337	1.14	2.00	2.28
Sequatchie.....	15,526	18,678	1.20	1.87	2.244
White.....					
Total.....	507,359	\$ 542,655	\$ 1.07	1.93	\$ 2.065

TABLE No. 6—Shows the production and other coke statistics in Tennessee for the years 1880, 1890, 1900 and from 1901 to 1909, inclusive.

Consolidated statistics of coke manufacture in Tennessee, 1880-1909.

YEAR	Establishments	OVENS		Coal Used (Short Tons)	COKE PRODUCED			Yield of Coal in Coke (per cent.)
		Built	Building		Quantity (Short Tons)	Total Value of Coke at Ovens	Value per Ton	
1880.....	6	656	68	217,656	130,609	\$ 316,607	\$ 2.42	60.00
1890.....	11	1,664	292	600,387	348,728	684,116	1.96	58.00
1900.....	13	1,923	50	946,597	494,438	1,186,655	2.40	52.20
1901.....	13	1,914	190	741,267	393,197	892,351	2.27	53.00
1902.....	14	2,227	360	988,989	555,188	1,709,745	3.06	56.14
1903.....	15	2,421	260	1,013,531	547,109	1,693,292	3.09	53.98
1904.....	16	2,390	200	731,867	386,875	923,120	2.38	52.86
1905.....	16	2,604	-----	871,590	468,799	1,184,555	2.52	53.78
1906.....	17	2,714	78	931,641	484,672	1,350,629	2.79	52.02
1907.....	17	2,819	-----	896,411	453,729	1,408,303	3.10	50.61
1908.....	16	2,719	-----	433,236	218,736	572,020	2.61	50.50
1909.....	16	2,700	15	507,359	262,750	669,547	2.55	51.78

TABLE No. 7—Shows the production and other coke statistics in the United States for the years 1880, 1890, 1900, and from 1901 to 1908, inclusive.

Consolidated statistics of coke manufacture in the United States, 1880-1908.

YEAR	Establishments	OVENS		Coal Used (Short Tons)	COKE PRODUCED			Yield of Coal in Coke (per cent.)
		Built	Building		Quantity (Short Tons)	Total Value of Coke at Ovens	Value per Ton	
1880.....	186	12,372	1,159	5,237,741	3,338,800	\$ 6,631,267	\$1.99	63.00
1890.....	253	37,158	1,547	18,005,209	11,508,021	23,215,302	2.02	64.00
1900.....	396	58,484	5,804	32,113,553	20,533,348	47,443,331	2.31	63.90
1901.....	423	63,951	5,205	34,207,965	21,795,883	44,445,923	2.039	63.70
1902.....	456	69,069	8,758	39,604,007	25,401,730	63,339,167	2.49	64.10
1903.....	500	79,334	6,175	39,423,525	25,274,281	66,498,664	2.63	64.10
1904.....	507	83,599	4,430	36,531,608	23,661,106	46,144,941	1.95	64.80
1905.....	519	87,564	4,751	49,530,677	32,231,129	72,476,196	2.25	65.10
1906.....	532	93,901	4,519	55,746,374	36,401,217	91,608,034	2.52	65.30
1907.....	552	99,680	2,546	61,946,109	40,779,564	111,539,126	2.74	65.80
1908.....	551	101,218	2,241	39,440,837	26,033,518	62,483,983	2.40	66.00

COPPER, GOLD AND SILVER

The Tennessee Copper Company, at Copperhill, and the Ducktown Sulphur & Iron Company, Ltd., at Isabella, Tenn., with home office in London, England, were the only producing copper companies in Tennessee in 1909. The plants of both companies are located in the Ducktown Mineral District, which extends through Polk County, Tennessee, into Fannin County, Georgia, and Cherokee County, North Carolina, and is one of the most interesting, as well as important, mineral regions in the United States.

During 1909 the Ducktown Company operated the Mary mine, and the Tennessee Copper Company operated the Burra Burra, Eureka, London and Polk County mines. Operations for both companies are as follows:

COPPER.

Total average number of employes	728
Average wages paid per day	\$2.22
Total amount paid for labor	\$472,973
Crude ore produced (short tons)	580,000
Value of product (crude ore)	\$713,675
Value per ton (crude ore)	\$1.23
Crude ore treated (short tons)	577,670
Refined copper produced (pounds)	19,083,099
Value of product (refined copper)	\$2,389,984
Average value per pound refined copper (cents)	12.982
Yield per ton of crude ore in metal (pounds)	33.03
Yield of crude ore in refined copper (per cent)	1.65
Stock on hand beginning of year (pounds)	1,276,074
Stock on hand at end of year (pounds)	961,648
Sales, quantity of (pounds)	19,397,525
Sales, amount of	\$2,430,803

GOLD.

Total product in fine ounces	281
Total value	\$5,623

SILVER.

Total product in fine ounces	124,262
Total value	\$62,347

The following table gives copper, gold and silver product in 1909, compared with 1908:

Production of copper, gold and silver in 1909, compared with 1908.

YEAR	COPPER ORE TREATED	METAL CONTENT					
		REFINED COPPER		GOLD		SILVER	
		Quantity (Pounds)	Value	Quantity (Fine Ounces)	Value	Quantity (Fine Ounces)	Value
1908	618,806	19,459,501	\$ 2,552,130	289	\$ 5,873	128,549	\$ 67,952
1909	577,670	19,083,099	2,389,984	281	5,623	124,262	62,347
Increase + or de- crease	41,136	376,402	\$ 162,146	8	\$ 250	4,287	\$5,605

The following table shows copper operations in Tennessee from 1898, the first year of activity, to 1909, inclusive:

Copper statistics in Tennessee from 1898 to 1909, inclusive.

YEAR	PRODUCT AND VALUE			Crude Ore Treated (Short Tons)	REFINED COPPER AND VALUE			Yield of Crude Ore in Re- fined Copper (per cent)	Yield in Pounds of Metal for Each Ton of Crude Ore
	Quantity (Short Tons)	Value Crude Ore	Value Per Ton		Quantity (Pounds)	Value	Value Per Pound (Cents)		
1898	95,568	\$205,471	\$ 2.15	80,083	3,240,740	\$ 356,481	.11	2.01	34.
1899	112,118	285,900	2.55	82,184	3,357,141	559,635	.1667	2.04	30.
1900	118,942	303,302	2.55	97,564	3,454,132	559,223	.1616	1.77	29.04
1901	267,830	669,575	2.50	162,461	5,732,048	908,914	.15857	1.71	21.40
1902	333,239	716,463	2.15	335,864	12,284,515	1,367,421	.11131	1.82	36.86
1903	319,873	719,714	2.25	370,278	13,668,389	1,809,081	.13235	1.84	42.76
1904	287,830	641,860	2.23	384,886	13,905,018	1,721,549	.1239	1.81	48.31
1905	384,192	864,432	2.25	399,330	14,541,425	2,219,938	.1526	1.87	37.85
1906	539,381	1,321,483	2.45	538,141	17,354,781	3,211,966	.185	1.61	32.20
1907	548,171	1,370,200	2.50	557,950	18,892,309	3,652,720	.193	1.72	33.86
1908	643,256	1,362,702	2.12	618,806	19,459,501	2,552,130	.131	1.57	31.45
1909	580,000	713,675	1.23	577,670	19,083,099	2,389,984	.12982	1.65	33.03

The Ducktown district is the principal copper producing region in the Eastern United States, and from a productive standpoint in 1907 it was ninth in rank of the producing copper camps of the United States. Both plants connect with the Louisville & Nashville Railroad, and are in close reach of both coal and coke. The output of this district can be increased as desired, or market conditions warrant.

The plant of the Ducktown Company is equipped with a 500-ton smelter, which concentrates the ore into a matte, which is either sold on the market or shipped for converting into refined copper.

The Tennessee Copper Company plant has a 1,600-ton smelter and seven blast furnaces. The smelting process is in two stages. The first consists of a concentration of the ore to a low grade of matte, averaging about 15 per cent copper. This matte is cooled in beds on the slag dump and then broken up and hauled to the smelter bins. The second stage is a concentration of the first matte to matte of converting grade. This can be varied at will, the present practice being to produce a matte of about 32 per cent copper, which is easily handled in the converters.

SULPHURIC ACID PLANT.

As an incident to the production of copper in the Ducktown district, there is being developed one of the largest and most extensive sulphuric acid plants in the world. The sulphur dioxide gas, which is generated from smelting the copper ores, has heretofore been incapable of treatment and has escaped into the atmosphere, causing much complaint on account of alleged injury to vegetation.

Early in 1908 the Tennessee Copper Company completed a sulphuric acid plant and began the concentration of these gases into commercial acid. The plant originally consisted of twelve chambers of 172,000 cubic feet each, or a total capacity of 2,064,000 cubic feet.

During 1909 the company began the construction of an additional plant, which, when completed, will more than double the chamber capacity of the present plant. The steel work on the new plant has been completed, the lead curtains are being hung, and the

connections and piping are being connected up, and new Gay Lussac and Glover towers have been constructed. The first chambers completed will be put into operation about June 1910, and as the others are finished they will be connected up and put into service until the entire plant is put in operation, which is expected to occur about September 15, 1910. The Ducktown Company has also constructed an acid plant similar to the one constructed by the Tennessee Copper Company, which was active for only six months during 1909. This plant will also be enlarged as conditions warrant.

During 1909 these two companies produced 66,585 short tons of sulphuric acid, valued at \$299,483, or \$4.48 per ton.

The Ducktown copper district is located within easy reach of all the phosphate fields of the South, and owing to the fact that the sulphuric acid produced will enter into the manufacture of commercial fertilizers, which are mostly consumed in the South, it is reasonable to assume that the successful production of sulphuric acid will result in the establishment of an industry, which should in a degree lessen the cost of fertilizers, and in addition add materially to the mineral industry of Tennessee.

The sulphuric acid heretofore made in the United States has practically all been made from ore imported from Spain, and it can be readily seen that the saving of freight and expenses of handling will eventually be of great economic value to all consumers of fertilizers in the United States.

USES OF COPPER.

During 1908 there were 1,101,416,100 pounds of refined copper output cast. The percentage used for wire bars was 47 per cent, ingots 26 per cent, cakes 12 per cent, cathodes 12 per cent, and other forms 3 per cent.

IMPORTS AND EXPORTS.

The following table gives imports and exports of copper for the United States in 1909:

CHARACTER OF PRODUCT	IMPORTS		EXPORTS	
	Quantity (Pounds)	Value	Quantity (Pounds)	Value
Pigs, bars, ingots, plates and old -----	240, 713, 721	\$ 30, 529, 425	682, 846, 726	\$ 89, 367, 455
All other manufacturers of (duty) -----		140, 855		3, 217, 185
Total not including ore -----	240, 713, 721	\$ 30, 670, 280	682, 846, 726	92, 584, 640
Ore, Matte & regulus (free) -----	81, 087, 393	9, 113, 254	119, 760, 000	1, 335, 316
Grand total -----	321, 801, 114	\$ 39, 783, 534	802, 606, 726	\$ 93, 919, 956

In addition to the above there were exported 5,680,973 pounds, or 2,841 short tons, of sulphuric acid, valued at \$69,356.

COPPER PRODUCTION FOR THE UNITED STATES.

The following table gives the copper production in the United States in 1908 (in pounds) by the principal copper districts.

Blister copper production (in pounds) of principal districts in the United States in 1908.

DISTRICT OR REGION	STATE	Approximate Smelter Output	Percentage of Total Production	Rank
Butte	Montana	252,500,000	26.79	1
Lake Superior	Michigan	222,000,000	23.55	2
Bisbee	Arizona	129,000,000	13.69	3
Morenci	Arizona	77,000,000	8.17	4
Bingham	Utah	56,000,000	5.94	5
Globe	Arizona	36,000,000	3.82	6
Jerome	Arizona	36,000,000	3.82	7
Shasta County	California	32,500,000	3.45	8
Ducktown	Tennessee	19,700,000	2.09	9
Ely	Nevada	9,400,000	1.00	10
Silver Bell	Arizona	6,700,000	.71	11
Cour d'Alene	Idaho	6,400,000	.68	12
Tintic	Utah	5,500,000	.58	13
Frisco	Utah	5,500,000	.58	14
Leadville	Colorado	4,600,000	.49	15
Calaveras County	California	4,500,000	.48	16
Santa Rita	New Mexico	4,000,000	.42	17
South Western Alaska	Alaska	3,000,000	.32	18
Encampment	Wyoming	2,300,000	.24	19
Lucin	Utah	2,300,000	.24	20
San Juan	Colorado	2,200,000	.24	21
Total .....	.....	917,100,000	97.30	-----
All others .....	.....	25,400,000	2.70	-----
Grand total .....	.....	942,500,000	100.00	-----

WORLD'S PRODUCTION.

The smelter production of copper in the world amounted to 1,667,098,000 pounds in 1908, of which the smelter output of the United States amounted to 942,500,000 pounds, or 56.53 per cent of the total world's supply. During 1907 the United States only furnished 54.66 per cent of the total world's product.

GAS, GAS COKE, TAR AND AMMONIA

The following table gives employes, coal carbonized, total quantity of gas produced in Tennessee in 1909 by counties, and quantity and percentage of gas sold, and gas lost or unaccounted for:

Coal carbonized, gas produced, gas sold and gas lost or unaccounted for in 1909.

COUNTY	Total Number of Employes	Coal Carbonized (Short Tons)	Total Gas Production (Cubic Feet)	GAS SOLD		GAS LOST OR UNACCOUNTED FOR	
				Quantity (Cubic Feet)	Percentage	Quantity (Cubic Feet)	Percentage
Davidson	100	13,065 ^b	303,115,100	221,549,670	73.09	81,565,430	26.81
Hamilton	100	16,000 ^b	153,000,000	140,000,000	83.66	13,000,000	16.34
Knox	107	15,077 ^b	134,992,000	118,466,900	87.76	16,525,100	12.24
Madison	22	3,177	31,770,000	28,276,400	89.03	3,493,600	10.97
Montgomery	7	957	9,000,000	7,200,000	80.00	1,800,000	20.00
Rutherford	2	600	1,473,996	1,473,996	100.00		
Shelby	25	^a	385,000,000	318,000,000	82.60	67,000,000	17.40
Sullivan	4	1,794	14,600,000	11,650,000	80.00	2,950,000	20.00
Total	367	50,670	1,032,951,096	846,616,966	81.96	186,334,130	18.04

^a Oil and water gas exclusively. No by-products. ^b Oil used also.

There is presented in the following table a statement showing the quantity and value of gas sold in Tennessee in 1909 for illuminating and fuel purposes, and price paid per 1,000 cubic feet:

Gas produced and sold for illuminating and fuel purposes in Tennessee in 1909.

COUNTY	GAS SOLD FOR ILLUMINATING PURPOSES			GAS SOLD FOR FUEL PURPOSES			TOTAL GAS SOLD		
	Quantity (Cubic Feet)	Value	Price Per 1,000 Cubic Feet	Quantity (Cubic Feet)	Value	Price Per 1,000 Cubic Feet	Quantity (Cubic Feet)	Value	Price Per 1,000 Cubic Feet
Davidson	132,929,802	\$132,929	\$ 1.00	88,619,868	\$ 88,620	\$ 1.00	221,549,670	\$221,549	\$ 1.00
Hamilton	84,000,000	84,000	1.00	56,000,000	56,000	1.00	140,000,000	140,000	1.00
Knox	61,500,000	61,700	1.00	56,966,900	56,978	1.00	118,466,900	118,678	1.00
Madison	13,477,000	20,081	1.49	14,799,400	19,776	1.33	28,276,400	39,857	1.41
Montgomery	4,320,000	5,553	1.30	2,880,000	3,702	1.30	7,200,000	9,255	1.30
Rutherford	1,000,000	1,500	1.50	473,996	700	1.47	1,473,996	2,200	1.49
Shelby	68,000,000	68,000	1.00	250,000,000	250,000	1.00	318,000,000	318,000	1.00
Sullivan	5,825,000	5,822	1.00	5,825,000	5,823	1.00	11,650,000	11,645	1.00
Total	371,051,802	\$379,585	\$ 1.02	475,565,164	\$481,599	\$ 1.01	846,616,966	\$861,184	\$ 1.01

RECAPITULATION.

Total average number of employes	367
Average wages paid per day	\$ 1.60
Total amount paid for labor	\$ 191,556
Total population of all gas districts	431,000
Number of miles of mains	416
Number of gas meters in use	44,204
Number of gas stoves in use	29,487
Oil used (gallons)	2,594,371

General candle power ranges from 16 to 20. Lowest pressure for gas stoves ranges from 2 to 3.5 inches. The process of manufacture for 4 plants is confined exclusively to coal, while there are 3 using both coal and Lowe, and one Lowe water gas exclusively. It is impossible to separate the coal gas from the oil and water gas.

CLASSIFIED PRODUCT AND VALUE.

Classified product and value in 1909.

KIND OF PRODUCT	Quantity	Value
By-Products:		
Ammonia liquor (451,420 gallons) equivalent to anhydrous ammonia		
NH ₃ (lbs)-----	175, 173	\$ 9, 321
Coke (short tons)-----	30, 082	99, 203
Tar (gallons)-----	719, 277	22, 283
Total by-products -----		\$ 130, 807
Gas sold (cubic feet)-----	846, 616, 966	861, 184
Grand total value -----		\$ 991, 991

Yield of Coal in Coke (per cent)----- 60.82

UNITED STATES PRODUCTION.

The following table gives the production of gas, gas coke, tar and ammonia, and value thereof, at gas works, and by-product coke oven works; and in oil and water gas works in the United States in 1908.

Gas, gas coke, tar and ammonia produced in the United States by all gas and by-product coke works in 1908.

KIND OF PRODUCT	Quantity	Value
Gas sold (cubic feet)-----	53, 561, 813, 000	\$ 37, 227, 901
Coke (short tons)-----	6, 253, 125	21, 507, 045
Tar (gallons)-----	101, 261, 829	2, 537, 118
Ammonia, reduced to NH ₃ (lbs)-----	30, 615, 835	3, 387, 976
Ammonia sulphate (pounds)-----	44, 093, 437	
Total from coal gas and by-product coke works -----		\$ 64, 660, 040
Oil and water gas works:		
Gas sold (cubic feet)-----	103, 347, 497	96, 343, 221
Tar sold (gallons)-----	9, 168, 834	229, 582
Total from oil and water gas works -----		\$ 96, 572, 803
Grand total from all gas and by-product coke works -----		\$ 161, 232, 843

a 5,559,199 additional gallons reported to have been made but not sold.

IMPORTS OF COAL TAR PRODUCTS IN 1909.

The coal tar products imported and entered for consumption in the United States in 1909 are as follows:

KIND OF PRODUCT	Quantity	Value
Salicylic acid (lbs du) alizarine and colors or dyes-----	3, 482	\$ 1, 591
Natural and artificial (lbs free)-----	3, 876, 921	1, 191, 870
Aniline Salts (lbs free)-----	6, 307, 226	552, 573
Coal tar colors and dyes (du)-----		6, 435, 925
Coal tar (all preparations, du) not colors or dyes not, medicinal-----		705, 638
Ammonium Sulphate (free)-----	39, 730, 041	977, 830
Ammonium Sulphate (duty)-----	46, 099, 293	1, 136, 864
Total -----		\$ 11, 002, 291

IRON ORE

The following table gives name and postoffice of all iron ore mine operators and name and location of all iron ore mines in Tennessee in 1909:

Iron ore mines and operators in Tennessee in 1909.

OPERATORS			MINE		
No.	COUNTY AND NAME	POSTOFFICE	No.	COUNTY AND NAME	POSTOFFICE
	<i>Campbell County</i>			<i>Campbell County</i>	
1	La Follette C., I & Ry. Co.	LaFollette	1	Hunter's Branch	LaFollette.
	<i>Carter County</i>			<i>Carter County</i>	
2	A. D. Reynolds	Butler	2	Limonite	Fish Springs.
3	{ Va. Iron, Coal & Coke Co.	Roanoke, Va.	3	{ Carpenter	Stony Creek
	{ Va. Iron, Coal & Coke Co.	Roanoke, Va.	4	{ Taylor	Stony Creek
	<i>Claiborne County</i>			<i>Claiborne County</i>	
4	{ American Asso., Inc.	Middlesboro, Ky.	5	Watts	Arthur.
	{ Va. Coal & Iron Co (Lessee)	Roanoke, Va.			
	<i>Cocke County</i>			<i>Cocke County</i>	
5	Commercial M. & M. Co.	Knoxville	6	Eureka	Del Rio.
	<i>Davidson County</i>			<i>Davidson County</i>	
6	{ Red River Furnace Co.	Clarksville	7	{ Jackson	Goodlettsville
	{ Red River Furnace Co.	Clarksville	8	{ Polk	Bakers.
	<i>Dickson County</i>			<i>Dickson County</i>	
7	Red River Furnace Co.	Clarksville	9	Pomp	Dent.
	<i>Hamilton County</i>			<i>Hamilton County</i>	
8	Chattanooga Co., Ltd.	Chattanooga	10	Kuntz	Hill City.
	<i>Hickman County</i>			<i>Hickman County</i>	
9	Bon Air Coal & Iron Co.	Nashville	11	Warner	Warner.
10	Napier Iron Works	Nashville	12	Aetna	Aetna.
11	Red River Furnace Co.	Clarksville	13	Spring Creek	Lyle.
12	Standard Iron Co.	Nashville	14	Nunnally	Nunnally.
	<i>Johnson County</i>			<i>Johnson County</i>	
13	Forge Mt. Mining Co.	Mountain City	15	Forge Mt.	Mountain City.
14	Maxwell-Knight Iron Co.	Butler	16	Maxwell	Doeville.
15	Taylor's Valley Iron Co.	Bristol	17	Taylor's Valley	Taylor's Val. Va.
	{ Va. Iron, Coal & Coke Co.	Bristol	18	Gentry	Shouns.
16	{ Va. Iron, Coal & Coke Co.	Bristol	19	{ Haskell	Shouns.
	{ Va. Iron, Coal & Coke Co.	Bristol	20	{ Yellow Hill	Shouns.
	{ Va. Iron, Coal & Coke Co.	Bristol	21	Little Mountain	Vaughtsville.
17	Ward Iron Co.	Abingdon, Va.	22	Ward	Ward.
	<i>Lawrence County</i>			<i>Lawrence County</i>	
18	Napier Iron Works	Nashville	23	Ferro	Ferro.
19	Pinkney Mining Co.	Pinkney	24	Tucker	Pinkney.
20	Rockdale Iron Co.	Rockdale	25	Gray	Pinkney.
21	Sheffield Coal & Iron Co.	Sheffield, Ala.	26	Hessmer 3	West Point.
	<i>Lewis County</i>			<i>Lewis County</i>	
22	Bon Air Coal & Iron Co.	Nashville	27	Wayne	Allen's Creek.
23	Warner Iron Co.	Nashville	28	Percy	Riverside.
	<i>Meigs County</i>			<i>Meigs County</i>	
24	Dayton Coal & Iron Co.	Dayton	29	Crescent	Euchee.
	<i>Monroe County</i>			<i>Monroe County</i>	
25	Tennessee Ore Co.	Sweetwater	30	Cleveland	Sweetwater.
	<i>Montgomery County</i>			<i>Montgomery County</i>	
26	Red River Furnace Co.	Clarksville	31	Louise	Louise.

Iron ore mines and operators in Tennessee in 1909.—Continued.

OPERATORS			MINE		
No.	COUNTY AND NAME	POSTOFFICE	No.	COUNTY AND NAME	POSTOFFICE
<i>Polk County</i>			<i>Polk County</i>		
27	Va. Iron, Coal & Coke Co.	Roanoke, Va.	32	Burra Burra	Ducktown.
	Va. Iron, Coal & Coke Co.	Roanoke, Va.	33	Cherokee	Ducktown.
	Va. Iron, Coal & Coke Co.	Roanoke, Va.	34	Eureka	Ducktown.
	Va. Iron, Coal & Coke Co.	Roanoke, Va.	35	Isabella	Ducktown.
	Va. Iron, Coal & Coke Co.	Roanoke, Va.	36	London	Ducktown.
	Va. Iron, Coal & Coke Co.	Roanoke, Va.	37	Ocoee (School)	Ducktown.
<i>Rhea County</i>			<i>Rhea County</i>		
28	Ewing Mining Co.	Rhea Springs	38	Ewing	Rhea Springs.
29	Underwood & Son	Rockwood	39	Underwood	Lorraine.
<i>Roane County</i>			<i>Roane County</i>		
30	Baker Mining Co.	Rockwood	40	Baker	Glen Alice.
	Baker Mining Co.	Rockwood	41	Glen Alice	Glen Alice.
31	Brown Mining Co.	Cardiff	42	Baker	Cardiff.
	Brown Mining Co.	Cardiff	43	Cardiff	Cardiff.
	Brown Mining Co.	Cardiff	44	Carter	Cardiff.
	Brown Mining Co.	Cardiff	45	Patton	Cardiff.
32	Brown Mining Co.	Cardiff	46	Wright	Cardiff.
	Ironton Ore Co.	Rockwood	47	Ironton	Hatch.
33	Roane Iron Co.	Rockwood	48	Chamberlain	Welcker.
<i>Stewart County</i>			<i>Stewart County</i>		
34	Dover Iron Co.	Bear Spring	49	Bear Spring	Bear Spring.
35	Dover Iron Co.	Bear Spring	50	(Contractors)	Bear Spring.
<i>Unicoi County</i>			<i>Unicoi County</i>		
36	Embree Iron Co.	Embreeville	51	Fowler	Embreeville.
	Embree Iron Co.	Embreeville	52	McNabb	Embreeville.
	Embree Iron Co.	Embreeville	53	Polly Hollow	Embreeville.
	Embree Iron Co.	Embreeville	54	Starnes	Embreeville.
	Embree Iron Co.	Embreeville	55	West Ore Bank	Embreeville.
<i>Washington County</i>			<i>Washington County</i>		
37	Embree Iron Co.	Embreeville	56	Cassie Creek	Embreeville.
	Embree Iron Co.	Embreeville	57	Klondyke	Embreeville.
	Embree Iron Co.	Embreeville	58	Number 10	Embreeville.
	Embree Iron Co.	Embreeville	59	Peedee	Embreeville.
	Embree Iron Co.	Embreeville	60	Sugar Hollow	Embreeville.
	Embree Iron Co.	Embreeville	61	Tunnell	Embreeville.
	Embree Iron Co.	Embreeville	62	Yates Hollow	Embreeville.
<i>Wayne County</i>			<i>Wayne County</i>		
38	Bon Air Coal & Iron Co.	Nashville	63	Mannie	Allen's Creek.

For convenience, Tennessee is divided into three iron ore districts.

The Eastern district is composed of the counties of Blount, Carter, Cocke, Greene, Hancock, Johnson, McMinn, Monroe, Polk, Sevier, Sullivan, Unicoi and Washington.

The middle district is composed of the counties of Anderson, Bledsoe, Campbell, Claiborne, Hamilton, James, Marion, Meigs, Rhea, Roane, Sequatchie, and Union.

The Western district is composed of the counties of Benton, Davidson, Decatur, Dickson, Hardin, Hickman, Humphreys, Lawrence, Lewis, Montgomery, Perry, Stewart, Sumner, and Wayne.

The following table shows total average number of employees, classified character and value of product, and explosives used in the operation of iron ore mines in Tennessee in 1909:

Iron ore operations in Tennessee in 1909.

COUNTY	Total Average Number of Employees	CHARACTER OF PRODUCT (Long Tons)			VALUE OF PRODUCT		EXPLOSIVES USED	
		Brown Hematite	Red Hematite	Total	Total Value	Value Per Ton	Dynamite (Pounds)	Powder (Kegs)
	1	5	6	7	9	10	11	12
Claiborne.....	100	9,560	-----	9,560	\$ 14,758	\$ 1.54	14,800	-----
Hickman.....	109	39,365	-----	39,365	60,479	1.54	2,800	900
Johnson.....	108	47,602	-----	47,602	72,324	1.52	32,450	-----
Lawrence.....	282	159,717	-----	159,717	246,225	1.54	4,450	3,455
Lewis.....	72	20,587	-----	20,587	27,772	1.35	1,000	1,200
Meigs.....	90	-----	26,253	26,253	41,907	1.60	10,850	-----
Monroe.....	8	-----	2,490	2,490	3,350	1.25	-----	-----
Montgomery.....	45	5,704	-----	5,704	10,267	1.80	500	300
Roane.....	560	-----	259,754	259,754	319,949	1.23	40,000	7,000
Stewart.....	45	11,829	-----	11,829	10,945	1.00	-----	-----
Unicoi.....	60	5,250	-----	5,250	7,875	1.50	-----	-----
Washington.....	25	2,632	-----	2,632	3,948	1.50	-----	-----
Wayne.....	122	58,082	-----	58,082	116,164	2.00	4,500	1,700
Total.....	1,626	360,328	288,497	648,825	\$935,963	\$ 1.44	111,350	14,555

RECAPITULATION

Total average number of employees.....	1,626
Average wages paid per day.....	\$ 1.45
Total amount paid for labor.....	\$ 575,781

Roane County is first in rank, with Lawrence second, and Wayne third. Johnson has dropped back from third position, and Hickman is fifth, while Meigs has dropped to sixth position from that of fourth.

The total value of brown hematite ore amounted to \$570,757, or \$1.58 per ton, and the total value of red hematite ore amounted to \$365,206, or \$1.27 per ton.

As compared with 1908, this is an increase in product of 59,837 long tons, or 10 per cent, and an increase in value of \$127,287, or 15.5 per cent.

The deposits in the counties of Cocke, Dickson, Hickman, Johnson, Lawrence, Lewis, Montgomery, Stewart, Unicoi, Washington and Wayne are in pockets. The deposits in the remaining counties under present development occur in regular ore seams or veins.

There were 394,597 long tons of ore consumed by the various producers or subsidiary companies in the manufacture of pig iron, at a valuation of \$627,191, or \$1.59 per ton. There were 263,427 long tons sold for \$338,208, or \$1.28 per ton.

For the percentage of metallic iron contained in the ore product, reference is directed to the statistics on pig iron manufacture immediately following the statistics of iron ore.

IRON ORE PRODUCTION IN THE UNITED STATES.

The iron ore product of the United States in 1908 amounted to 35,983,336 long tons, four-fifths of which were furnished by Minnesota and Michigan, with Minnesota first in rank, furnishing 18,652,220 long tons. Tennessee is now seventh in rank as to product, and eighth in rank as to value.

The following table shows product and value of iron ore produced in Tennessee in 1909, by counties, compared with 1908, showing increases and decreases:

Product and value of iron ore in Tennessee in 1909 compared with 1908.

COUNTY	1909		1908		Increase + or decrease —	
	Product (Long Tons)	Value	Product (Long Tons)	Value	Product (Long Tons)	Value
Claiborne.....	9,560	\$ 14,758	-----	-----	+ 9,560	+\$ 14,758
Davidson.....	-----	-----	8,586	\$ 8,586	- 8,586	- 8,586
Dickson.....	-----	-----	5,099	9,178	- 5,099	- 9,178
Hickman.....	39,365	60,479	34,954	55,028	+ 4,411	+ 5,451
James.....	-----	-----	200	560	- 200	- 560
Johnson.....	47,602	72,324	50,639	68,208	- 3,037	+ 4,116
Lawrence.....	159,717	246,225	134,542	194,682	+25,175	+ 51,543
Lewis.....	20,587	27,772	28,451	46,126	- 7,864	- 18,354
Meigs.....	26,253	41,907	38,812	52,904	-12,559	- 10,997
Monroe.....	2,490	3,350	-----	-----	+ 2,490	+ 3,350
Montgomery.....	5,704	10,267	4,255	7,659	+ 1,449	+ 2,608
Polk.....	-----	-----	36,141	37,127	-36,141	- 37,127
Rhea.....	-----	-----	3,150	4,215	- 3,150	- 4,215
Roane.....	259,784	319,949	176,241	218,427	+83,513	+ 101,522
Stewart.....	11,829	10,945	8,198	7,761	+ 3,631	+ 3,184
Unicoi.....	5,250	7,875	6,218	6,218	- 968	+ 1,657
Washington.....	2,632	3,948	15,007	15,007	-12,375	- 11,059
Wayne.....	58,082	116,164	38,495	76,990	+19,587	+ 39,174
Total.....	648,825	\$ 935,963	588,988	\$808,676	+59,837	+\$127,287

The following table shows product and value of iron ore in Tennessee from 1892 to 1909, inclusive:

Product and value of iron ore in Tennessee, 1892 to 1909, inclusive.

YEAR	Product (Long Tons)	Value	Value Per Ton	YEAR	Product (Long Tons)	Value	Value Per Ton
1892.....	406,578	-----	-----	1901.....	620,458	-----	-----
1893.....	372,996	-----	-----	1902.....	628,870	\$ 754,644	\$ 1.20
1894.....	292,831	-----	-----	1903.....	724,264	878,909	1.21
1895.....	519,796	-----	-----	1904.....	539,820	613,705	1.14
1896.....	535,484	-----	-----	1905.....	730,981	962,427	1.32
1897.....	604,497	-----	-----	1906.....	879,059	1,252,853	1.42
1898.....	617,579	-----	-----	1907.....	817,767	1,306,727	1.60
1899.....	667,149	-----	-----	1908.....	588,988	808,676	1.37
1900.....	699,724	-----	-----	1909.....	648,825	935,963	1.44

IMPORTS AND EXPORTS IN 1909.

The imports of iron ore entered for consumption in the United States in 1909 amounted to 1,696,421 long tons, valued at \$4,630,084. The exports of iron ore amounted to 455,934 long tons, valued at \$1,365,325.

IRON (PIG)

The following table gives name and postoffice address of all pig iron manufacturers and furnaces in Tennessee in 1909:

Pig iron manufacturers and furnaces in Tennessee in 1909.

MANUFACTURERS			FURNACE		
No.	COUNTY AND NAME	POSTOFFICE	No.	COUNTY AND NAME	LOCATION
	<i>Campbell County</i>			<i>Campbell County</i>	
1	LaFollette O., I. & Ry. Co.	LaFollette	1	aLaFollette	LaFollette.
	<i>Dickson County</i>			<i>Dickson County</i>	
2	Warner Iron Co	Nashville	2	Cumberland	Cumb. Furnace.
	<i>Hamilton County</i>			<i>Hamilton County</i>	
3	Citico Furnace Co.	Chattanooga	3	Citico	Chattanooga.
4	Southern Steel Co.	Birmingham, Ala.	4	Southern	Chattanooga.
	<i>Hickman County</i>			<i>Hickman County</i>	
5	Bon Air Coal & Iron Co.	Nashville	5	aWarner	Warner.
6	Napier Iron Works	Nashville	6	aAetna	Aetna.
7	Standard Iron Co.	Nashville	7	Standard	Goodrich.
	<i>Lewis County</i>			<i>Lewis County</i>	
8	Napier Iron Works	Nashville	8	Napier	Napier.
	<i>Marion County</i>			<i>Marion County</i>	
9	{ Tenn. Coal, I. & R. R. Co.	Birmingham, Ala.	9	aSouth Pittsburg 1	South Pittsburg
	{ Tenn. Coal, I. & R. R. Co.	Birmingham, Ala.	10	aSouth Pittsburg 2	South Pittsburg
	{ Tenn. Coal, I. & R. R. Co.	Birmingham, Ala.	11	aSouth Pittsburg 3	South Pittsburg
	<i>Mauzy County</i>			<i>Mauzy County</i>	
10	Rockdale Iron Co.	Rockdale	12	Rockdale	Rockdale.
	<i>Montgomery County</i>			<i>Montgomery</i>	
11	Red River Furnace Co.	Clarksville	13	Red River	Clarksville.
	<i>Rhea County</i>			<i>Rhea County</i>	
12	{ Dayton Coal & Iron Co.	Dayton	14	Dayton (1)	Dayton.
	{ Dayton Coal & Iron Co.	Dayton	15	Dayton (2)	Dayton.
	<i>Roane County</i>			<i>Roane County</i>	
13	{ Roane Iron Co.	Rockwood	16	Rockwood (1)	Rockwood.
	{ Roane Iron Co.	Rockwood	17	Rockwood (2)	Rockwood.
	{ Roane Iron Co.	Rockwood	18	Rockwood (3)	Rockwood.
	<i>Stewart County</i>			<i>Stewart County</i>	
14	{ Dover Furnace Co.	Carlisle	19	abBear Spring	Bear Spring.
	{ Dover Furnace Co.	Carlisle	20	bDover	Carlisle.
	<i>Washington County</i>			<i>Washington County</i>	
15	Cranberry Furnace Co.	Cranberry, N. C.	21	Cranberry	Johnson City.
16	Embree Iron Co.	Embreeville	22	Embree	Embreeville.
	<i>Wayne County</i>			<i>Wayne County</i>	
17	{ Bon Air Coal & Iron Co.	Nashville	23	Mannle (1)	Allen's Creek.
	{ Bon Air Coal & Iron Co.	Nashville	24	Mannle (2)	Allen's Creek.

(a)—Not active. (b)—Cold blast, charcoal furnace.

The iron ore necessary to operate these furnaces is obtained from the country surrounding or adjacent to the location of the furnaces, and by examining the percentage of yield of ore in pig iron, comparative value of the ore produced can be determined.

The following table shows average number of employees, average number of days active, quantity of iron ore treated, percentage of yield of ore in iron, and quantity of pig iron produced in Tennessee in 1909:

Pig iron employees, ore treated, and pig iron product in Tennessee in 1909.

COUNTY	Average Number of Employees	Average Number of Days Active	Iron Ore Treated (long tons)	Pig Iron Produced (long tons)	Yield of Ore in Iron (Per Cent)
Dickson.....	81	250	35,926	16,326	45.44
Hamilton.....	255	131	100,000	34,645	34.64
Hickman.....	64	304	32,051	15,558	48.57
Lewis.....	79	360	64,871	31,701	48.87
Maury.....	35	306	18,887	9,261	48.98
Montgomery.....	100	243	50,449	24,453	48.42
Rhea.....	180	257	119,206	48,255	40.48
Roane.....	250	230	194,813	77,702	40.00
Stewart.....	31	265	6,100	2,932	48.07
Washington.....	266	160	90,015	40,341	44.82
Wayne.....	52	356	64,209	29,447	45.87
Total.....	1,393	228	776,527	330,611	40.00

RECAPITULATION.

Total average number of employees.....	1,393
Average wages paid per day.....	\$ 1.41
Total amount paid for labor.....	\$ 450,312
Total product (long tons).....	330,611
Total value of product.....	\$4,473,739
Average value per ton of product.....	\$13.53
Stock on hand beginning of year (long tons).....	16,596
Stock on hand end of year (long tons).....	30,237

As compared with 1908, pig iron product shows an increase of 41,797 long tons, or 14.50 per cent, and an increase in value of \$743,300, or 20 per cent. There was also an increase of 61 cents per ton.

MATERIAL USED IN THE MANUFACTURE OF PIG IRON.

Iron ore (long tons).....	776,527
Coke (short tons).....	592,359
Limestone flux (short tons).....	218,062
Phosphate rock (long tons).....	5,513
Charcoal (bushels).....	500,900
Cinders (long tons).....	2,691
Scrap Iron (long tons).....	57

Eliminating the charcoal furnace and phosphate operations, it required an average of 3,600 pounds of coke, an average of 5,286 pounds of iron ore, and an average of 1,320 pounds of limestone for fluxing to make one ton of pig iron.

The average percentage of cost that each ingredient entering into pig iron manufacture bears to the total average cost of pig iron (including amount paid for freight) is: Labor, 14.24 per cent; iron ore, 42.54 per cent; coke, 38.71 per cent; stone for fluxing, 4.51 per cent.

The following table gives classified value and product of pig iron produced in Tennessee in 1909:

Classified product and value of pig iron in Tennessee in 1909:

Character of Product	Amount of Product (long tons)	Value of Product	Value per ton of Product
Cold blast.....	2,932	\$ 93,840	\$ 32.00
Ferro Phosphorus.....	3,385	147,269	43.50
No. 1. soft.....	25,227	350,748	14.26
No. 2. soft.....	34,223	446,185	13.04
No. 1. Foundry.....	12,852	151,846	11.81
No. 2. Foundry.....	87,676	1,076,802	12.28
No. 3. Foundry.....	22,592	266,454	11.80
No. 4. Foundry.....	33,253	381,596	11.48
Gray Forge.....	7,941	97,231	12.25
Mottled White.....	2,881	33,108	11.50
Furnace Scrap.....	360	4,860	13.50
Over .05 Sulphur.....	5,433	74,299	13.37
Under .05 Sulphur.....	91,757	1,348,913	14.70
Plates.....	49	588	12.00
Total.....	330.611	\$4,473,739	\$ 13.53

IRON AND STEEL INDUSTRY OF THE UNITED STATES.

During 1908 there were 21 States producing pig iron, contributing a total tonnage of 15,936,018 long tons, valued at \$254,325,000, or \$15.96 per ton. Tennessee was seventh in rank of producing States. The production by kinds in long tons is as follows:

Bessemer and low phosphorus.....	7,216,976
Basic (mineral fuel).....	4,010,144
Forge pig iron.....	457,164
Foundry and ferro silicon.....	3,637,622
Malleable Bessemer.....	414,957
Spiegeleisen.....	111,376
Ferromanganese.....	40,642
White Mottled, direct castings etc.....	47,137
Total.....	15,936,018

The total production of Bessemer steel ingots and castings in 1908 amounted to 6,116,755 long tons. The open-hearth steel amounted to 7,836,729 long tons, the crucible steel amounted to 63,631 long tons, which, with other steel product of 6,132 long tons, aggregate 14,023,247 long tons as the total steel product in 1908, as compared with 23,362,594 long tons in 1907.

IMPORTS AND EXPORTS, 1909.

The pig iron imported and entered for consumption in the United States in 1909 amounted to 174,988 long tons, valued at \$5,057,039. The exports of pig iron in 1909 amounted to 61,999 long tons, valued at \$1,036,267.

ELECTRIC SMELTING.

It is reported that the electric plant erected by the Electro-Metall Company of Ludvika, Sweden, for the purpose of smelting iron and making steel by electricity, has been quite a success.

LEAD AND ZINC

The following table gives lead and zinc operations in Tennessee in 1909 by counties:

Lead and zinc operations in Tennessee in 1909.

COUNTY	Average Number of Employees	ORES				METAL CONTENT			
		LEAD CONCENTRATES—Carbonate		ZINC CONCENTRATES—Blende and Carbonate		LEAD		ZINC	
		Quantity (Short Tons)	Value	Quantity (Short Tons)	Value	Quantity (Pounds)	Value	Quantity (Pounds)	Value
Jefferson -----	132	-----	-----	1,786	\$ 41,236	-----	-----	1,312,926	\$ 97,969
Knox -----	27	-----	-----	236	7,006	-----	-----	260,150	18,000
Total ---	159	-----	-----	2,022	\$ 48,236	-----	-----	1,573,076	\$115,969

RECAPITULATION.

Total average number of employees -----	159
Average wages paid per day -----	\$ 1.31
Total amount paid for labor -----	\$ 37,355

It will be observed that no lead was produced in Tennessee in 1909. Some zinc mines produce lead also, but the operations in 1909 were confined to mines producing zinc only.

The product and value of lead and zinc in Tennessee since operations began, including prospects, are as follows:

Lead and zinc product and value in Tennessee in 1902-1909.

YEAR	ORES				METAL CONTENT			
	LEAD CONCENTRATES—Carbonate		ZINC CONCENTRATES—Blende and Carbonate		LEAD		ZINC Blende & Carbonate	
	Quantity (Short Tons)	Value	Quantity (Short Tons)	Value	Quantity (Pounds)	Value	Quantity (Pounds)	Value
1902 -----	225	-----	420	-----	40,000	\$ 2,000	26,000	\$ 1,620
1903 -----	610	-----	1,700	-----	115,500	5,760	104,500	6,120
1904 -----	780	-----	300	-----	147,500	7,200	18,500	1,204
1905 -----	1,120	-----	774	-----	213,400	10,670	48,000	2,874
1906 -----	415	-----	200	-----	78,500	3,750	12,500	750
1907 -----	85	-----	1,118	-----	15,700	785	251,198	14,821
1908 -----	-----	-----	1,554	-----	-----	-----	371,677	26,570
1909 -----	-----	-----	2,022	\$48,236	-----	-----	1,573,076	\$115,969

IMPORTS AND EXPORTS, 1909.

The lead imported and entered for consumption in the United States in 1909 amounted to \$4,385,316. The total zinc imports amounted to \$2,213,109.

The total lead exports amounted to \$509,542, and the zinc exports amounted to \$1,222,173.

WORLD'S PRODUCTION.

During 1908, there were produced 1,145,165 short tons of lead in the world, of which the United States produced 310,762 short tons, or 27.13 per cent. Missouri led with 122,451 short tons, while Idaho was second with 98,464 short tons.

During 1908, there were produced 796,832 short tons of zinc spelter in the world, of which the United States produced 210,424 short tons, or 26.30 per cent. The State of Missouri led with 123,655 short tons, apportioned according to sources of ore.

LIME

The following table gives number of employees and total quantity and value of lime by works reported active in Tennessee in 1909:

Lime product and other statistics in Tennessee in 1909.

COUNTY	Total Number of Employees	Quantity of Lime Burned (S. Tons)	Value of Lime Burned	Value of Lime Per Ton
Coffee.....	50	5,828	25,035	\$ 4.30
Davidson.....	8	1,116	3,627	3.27
Dickson.....	40	8,000	28,000	3.50
Franklin.....	30	21,200	63,600	3.00
Greene.....	1	80	250	3.12
Houston.....	70	15,100	45,180	3.00
James.....	30	3,370	12,107	3.60
Knox.....	59	17,183	48,354	2.81
Lawrence.....	11	96	409	4.26
Mauzy.....	5	229	1,240	5.40
Montgomery.....	4	600	2,100	3.50
Putnam.....	2	100	200	2.00
Rhea.....	40	6,400	24,000	3.75
Union.....	28	5,092	15,410	3.00
Total.....	378	84,394	\$ 269,512	\$ 3.20

RECAPITULATION

Total average number of employees.....	378
Average wages paid per day.....	\$ 1.20
Total amount paid for labor.....	\$ 90,137
Total quantity of stone burned (short tons).....	125,251
Total value of stone burned.....	\$ 66,963
Estimated cost of fuel.....	\$ 74,928

USES OF LIME PRODUCT.

The following table gives lime production in Tennessee in 1909, classified according to uses:

Lime production in Tennessee in 1909, classified by uses.

USE	Quantity (S. Tons)	Value	Value Per Ton
Building.....	41,587	\$ 136,147	\$ 3.27
Dealers (uses not specified).....	4,499	16,216	3.60
Fertilizers.....	47	103	2.20
Hydrated.....	5,235	26,175	5.00
Paper Mills, Sulphate and Soda pulp Works.....	16,268	42,279	2.60
Sugar factories.....	2,500	8,750	3.50
Tanneries.....	1,626	5,460	3.35
Chemical purposes.....	11,200	29,600	2.64
Other purposes.....	1,432	4,782	3.34
Total.....	84,394	\$ 269,512	\$ 3.20

FUELS USED IN BURNING LIME

Coal (short tons).....	17,349	Lime product (short tons).....	44,154
Coke (short tons).....	830	Lime product (short tons).....	1,186
Wood (cords).....	4,454	Lime product (short tons).....	18,796
{ Coal (short tons).....	3,350	Lime { product (short tons).....	20,268
{ and wood (cords).....	1,275	Lime {	
Total.....			84,394

IMPORTS AND EXPORTS.

The imports of lime in 1909 for consumption in the United States amounted to 8,687 short tons, valued at \$75,555. The exports were 12,942 short tons, valued at \$99,324.

MANGANESE

The manganese ores of Tennessee occur near the eastern border of the Appalachian Valley deposits. The only deposits now known occur in Cocke County, near Newport and Del Rio, and near Shady Valley, in Johnson County.

The ore is both soft and hard, the soft ore occurring in pockets and seams associated with clays, and the latter in irregular masses scattered through the clay and soft ore pockets.

The mines were all idle during 1909 on account of adverse trade conditions. The following paragraph, which is an extract from a chapter upon the production of manganese in the United States in 1908, and appearing in the report of the United States Geological Survey, for that year, is by request herein reproduced:

USES.

"The uses of manganese in the industries may be classified as follows: 1. Metallurgical in the manufacture of alloys and in copper and silver reduction; (2) Chemical as an oxidizer, and as a coloring material.

Metallurgical Uses.

"The manganese ores used in the manufacture of alloys are dependent in value upon the percentage of metallic manganese present, and on the absence of injurious substances like phosphorous and sulphur. The latter is especially true in the case of the alloys with iron. Spiegeleisen and ferro-manganese are alloys of iron and manganese. The former contains below 20 per cent manganese, while the latter has a manganese content ranging from 20 per cent to 90 per cent, above which the alloy becomes unstable. Silicon and carbon are present in varying quantities. Spiegeleisen and ferro-manganese are used in the manufacture of steel in the following ways: (a) As reducers of iron oxide in the final melting, in which case the manganese oxide formed goes into the slag; (b) as recarburizers of steel, in which case they contain desirable carbon; (c) for counteracting the effects of phosphorous and sulphur by the formation of manganese compounds with these elements; (d) in the manufacture of manganese steel used for railroad and street car rails and curves, for burglar-proof safes, for car wheels, and for other purposes. The addition of small quantities of manganese gives to steel hardness, ductility and strength.

"Manganese is also used to form alloys with copper, zinc, aluminum, tin, lead, magnesium and silicon, and with combination of these metals.

"Manganese oxides are used to a slight extent in copper and silver reduction as a substitute for iron oxides.

Chemical Uses.

"As an oxidizer manganese oxide is used in the manufacture of chlorine, bromine and oxygen, and of disinfectants like potassium permanganate; as a drier in paints and varnishes; as a decolorizer of glass, and in the Leclanche battery. In these cases the value of the ore depends on its available oxygen content—that is, on its percentage of pyrolusite or manganese peroxide.

"As a coloring material manganese is used in calico dyeing; for coloring bricks, glass and pottery, and in the manufacture of green and violet paints.

"Compounds of manganese are used in a small way for medicine, and the mineral rhodonite, a silicate of manganese, is used rarely for ornamental purposes on account of its beautiful pink color."

The production of manganese in the United States in 1908 was confined to the State of Virginia, which produced 6,144 long tons valued at \$62,779.

During 1909, there were imported and entered for consumption in the United States 212,765 long tons of manganese ore and oxide, valued at \$1,405,329.

MINERAL PAINTS

The following table gives the production and value of mineral paints in Tennessee in 1909 by counties:

Production and value of mineral paints in Tennessee in 1909.

COUNTY	Total Number of Employees	METALLIC PAINT		MORTAR COLORS		TOTAL	
		Quantity (Short Tons)	Value	Quantity (Short Tons)	Value	Quantity (Short Tons)	Value
Bradley.....	11	600	\$ 5,100			600	\$ 5,100
James.....	11			175	\$ 1,487	175	1,487
Monroe.....	4	860	1,075			860	1,075
Total.....	26	1,460	\$ 6,175	175	\$ 1,487	1,635	\$ 7,662

RECAPITULATION

Total average number of employees.....	26
Average wages paid per day.....	\$ 1.80
Total amount paid for labor.....	\$ 5,692

The following table shows the product and value of mineral paints in the United States in 1908:

Product and value of natural mineral paints in the United States in 1908 in short tons.

KIND	Quantity	Value
Ocher.....	17,019	\$ 156,360
Umber and Sienna.....	2,756	70,996
Metallic paint.....	216,224	182,007
Mortar Colors.....	9,026	86,961
Slate and shale, ground.....	4,828	40,220
Total.....	49,853	\$ 536,544

Note: Practically all ocher came from Georgia and Pennsylvania.

a Includes small quantity of unground material.

IMPORTS IN 1909.

KIND	Quantity (Pounds)	Value
White lead and pigments.....	694,599	\$ 39,963
Red lead.....	760,179	30,427
Litharge.....	90,655	3,740
Orange mineral.....	496,231	27,562
Venetian red.....	3,990,560	28,864
Other metallic paints.....	9,135,316	657,047
All other paints not including black.....		796,099
Total.....		\$1,583,702

Zinc oxide, known to the trade as zinc white, is the most important of the zinc pigments. It is represented by the formula ZNO, and is a white powder consisting by weight of 80.34 per cent zinc and 19.66 per cent oxygen.

MINERAL WATERS

The following table shows quantity and value by uses of mineral waters sold in Tennessee in 1909 by counties:

Production and value of mineral waters in Tennessee in 1909.

COUNTY	Number of Springs Reporting Sales	Quantity Sold (Gallons)	Average Retail Price Per Gallon at Spring	VALUE OF WATERS SOLD		
				Medicinal Purposes	Table Purposes	Total
Blount	1	500	.02	---	10	10
Cheatham	1	7,563	.05	378	---	378
Davidson	8	610,186	.052	10,549	21,097	31,646
Franklin	1	1,200	---	600	---	600
Grainger	1	153,000	.13	19,890	---	19,890
Hawkins	2	35,778	.119	4,269	---	4,269
Henderson	1	3,000	.10	300	---	300
Knox	2	58,000	.053	3,080	---	3,080
Macon	2	4,875	.12	585	---	585
Montgomery	1	325	.05	16	---	16
Rhea	1	50,000	.10	2,000	3,000	5,000
Williamson	1	1,000	.35	350	---	350
Wilson	2	63,750	.10	6,375	---	6,375
Total	24	989,177	.073	\$ 48,392	\$ 24,107	\$ 72,499

It will be observed that Davidson County ranks first in both quantity and value of product, with Grainger second, and Wilson third.

Name and location of springs in Tennessee reporting operations.

COUNTY	NAME OF SPRING	LOCATION OF SPRING	POSTOFFICE
Blount	Montvale	Chilhowie Mountain	Maryville.
do	Nebo	do	Walland.
do	Wildwood	do	Walland.
Cheatham	Willc w Brook	Craggie Hope	Craggie Hope.
Davidson	Buena Vista	Nashville	Nashville.
do	Burns Epsom Lithia	do	do.
do	Deep Cave	do	do.
do	Laconia	do	do.
do	Lockland (old)	do	do.
do	Pioneer	do	do.
do	Richardson's Lockland	do	do.
do	Sulphur (old)	do	do.
do	Thompson's	do	do.
Franklin	Eastbrook	Eastbrook	Estill Springs.
Grainger	Tate	Tate Springs	Tate Springs.
do	Lea	Lea Springs	Lea Springs.
Hawkins	Galbraith Springs	Galbraith Springs	Galbraith Springs.
do	Wright's Epsom Lithia	Mooreburg	Mooreburg.
Henderson	Hinson	Hinson Springs	Hinson Springs.
Knox	Neuberts	Knoxville, 7 mi. So.	Knoxville.
do	Whittle	Knoxville	Knoxville.
Macon	Red Boiling	Red Boiling Springs	Red Boiling Springs.
do	Epperson	Westmoreland	Westmoreland.
Montgomery	Idaho	Clarksville	Clarksville.
Rhea	Rhea	Rhea Springs	Rhea Springs.
Unicoi	Unaka	Unaka Mts	Unaka Springs.
Sevier	Dupont	Chilhowie Mt. (top)	Sevierville, r. f. d.
Williamson	Aqua Sanitas	Franklin, 10 Mi.	Franklin.
Wilson	Hamilton	Horn Springs	Horn Springs.
do	Horn	Horn Springs	Horn Springs.

UNITED STATES PRODUCTION.

The product of mineral waters in the United States in 1908 amounted to 56,108,820 gallons, which brought \$7,287,269, or 13 cents per gallon. The amount sold for medicinal purposes amounted to \$2,752,696, and the amount sold for table use brought \$4,534,573.

IMPORTS.

The imports of mineral waters entered for consumption in the United States in 1909 amounted to 33,666,237 gallons, valued at \$1,128,814.

NATURAL GAS

While there have been no active commercial operations looking to utilizing natural gas in Tennessee, it is known to exist in quantities in Franklin County.

An oil well was drilled 1,500 feet deep on the farm of J. C. Hale, near Winchester, and at a depth of 400 feet a strong flow of gas was struck. The gas has been utilized for the past few years for light and fuel by Mr. Hale. The well has a 45-pound pressure to the square inch, and has never diminished.

Another oil well was sunk 1,500 feet and at a depth of 200 feet struck a strong flow of gas. Another well was recently drilled near Winchester for water, and at a depth of 120 feet struck quite a flow of gas.

Prior to 1885 Pennsylvania produced all the natural gas produced in the United States. The table below gives the approximate value of the natural gas produced in the United States for 1885 and 1908 by States, from which the growth of the industry may be seen:

STATE	1885	1908
Pennsylvania.....	\$ 4,500,000	\$ 19,104,944
New York.....	196,000	959,280
Ohio.....	100,000	8,244,835
West Virginia.....	40,000	14,837,130
Illinois.....	1,200	446,077
Indiana.....		1,312,507
Kansas.....		7,691,587
Missouri.....		22,592
California.....		307,652
{ Alabama.....		{ 236,837
{ Texas.....		
{ Louisiana.....		
Kentucky.....		424,271
Tennessee.....		350
{ Arkansas.....		{ 164,930
{ Colorado.....		
{ Wyoming.....		
South Dakota.....		24,400
Oklahoma.....		860,159
North Dakota.....		2,480
Oregon.....		250
Iowa.....		93
Others.....	20,000	
Total.....	\$ 4,857,200	\$ 54,640,374

NATURAL GAS CONSUMED IN THE UNITED STATES IN 1909.

PURPOSES	Quantity, 1,000 Cubic Feet	Cents Per 1,000 Cubic Ft.	Value
Domestic.....	140,583,732	23.6	\$ 33,215,041
Industrial.....	261,556,998	8.19	21,425,333
Total.....	402,140,730	13.59	\$ 54,640,374

PETROLEUM

There are three oil wells in Tennessee, situated in Fentress County, on the Southern border of the Kentucky-Tennessee oil field.

They are on the Beaty, Choate and Compton farms, and produced considerable oil up to and including 1906.

The Cumberland Pipe Line Company, of Somerset, Ky., was connected with these wells and received all the oil product until the withdrawal of the company in September, 1906. There has been no oil marketed from them since that time.

Tennessee belongs to the Appalachian oil field, the oils of which are practically free from sulphur and asphalt, are rich in paraffin wax and yield the largest percentage of gasoline and illuminating oils.

The field extends from Western New York southwest along the western side of the Allegheny Mountains through Pennsylvania, Eastern Ohio, West Virginia, into Kentucky and Tennessee.

The following table shows total quantity and value of crude petroleum produced in the United States, and the average price per barrel in 1908:

STATE	1908		
	Quantity (Barrels)	Value	Average Price Per Barrel
California.....	44,854,737	\$ 23,433,502	\$ 0.5225
Colorado.....	379,653	346,403	.913
Illinois.....	33,685,106	22,648,881	.672
Indiana.....	3,283,629	3,203,883	.976
Kansas.....	1,801,781	746,695	.414
Kentucky.....	727,767	706,811	.971
Tennessee.....			
Louisiana.....	6,835,130	4,131,173	.604
Michigan.....	15,246	22,345	1.466
Missouri.....			
New York.....	1,160,128	2,071,533	1.7856
Ohio.....	10,858,797	14,178,502	1.306
Oklahoma.....	45,798,765	17,694,843	.386
Pennsylvania.....	9,424,325	16,881,194	1.7912
Texas.....	11,206,464	6,700,708	.598
Utah.....	17,775	27,920	1.57
Wyoming.....			
West Virginia.....	9,523,176	16,911,865	1.776
Total.....	179,572,479	\$129,706,258	\$.722

a The barrel used in this report contains 42 Winchester gallons.

WORLD'S PRODUCTION.

The world's production of petroleum in 1908 amounted to 284,614,022 barrels, of which the United States produced 63.09 per cent, and Russia produced 21.85 per cent.

PHOSPHATE ROCK

The following table gives name and postoffice of phosphate operators and superintendents of plants in Tennessee in 1909 by counties:

Phosphate operators and superintendents in Tennessee in 1909.

No.	OPERATORS		SUPERINTENDENTS	
	COUNTY AND NAME	POSTOFFICE	COUNTY AND NAME	POSTOFFICE
	<i>Davidson County.</i>		<i>Davidson County.</i>	
1	Charleston, S.C.M. & Mfg. Co.	Charleston, S. C.	E. W. Faucette	Mt. Pleasant.
2	Sterling Phosphate Co.	Columbia	John W. Fry	Columbia.
	<i>Decatur County.</i>		<i>Decatur County.</i>	
3	Tenn. Valley Phosphate Co.	Parsons	R. A. Gunn	Parsons.
	<i>Giles County.</i>		<i>Giles County.</i>	
4	International Agricultural Cor.	115 Brdwy, N. Y.	G. W. Killibrew	Mt. Pleasant.
5	Syndicate Phosphate Co.	Odd Fellows Hall.	John W. Fry	Columbia.
	<i>Hickman County.</i>		<i>Hickman County.</i>	
6	American Phos. Mining Co.	2 Rector St., N. Y.	E. B. Wilson	Wales.
7	Armour Fertilizer Works	Chicago, Ill.	S. W. Carmack	Centreville.
8	Centreville Phosphate Co.	Columbia	E. B. Short	Centreville.
9	Charleston, S.C. M. & Mfg. Co.	Charleston, S. C.	E. W. Faucette	Mt. Pleasant.
10	Chickamauga Fer. Works	Atlanta, Ga.	J. D. McCarty	Centreville.
11	Corn Belt Phosphate Co.	Centreville	H. Pitse	Centreville.
12	Independent Phos. Co.	Centreville	H. M. Jamison	Santa Fe, R. 2
13	Indian Creek Phos. Co.	Centreville	E. M. Foster	Nashville.
14	International Agr. Cor.	115 Brdwy, N. Y.	G. W. Killibrew	Mt. Pleasant.
15	Meridian Fertilizer Co.	Meridian, Miss.	A. J. Robertson	Centreville.
16	N. Y. St. Louis & M. M. Co.	St. Louis, Mo.	B. W. Brice	Aetna.
17	Prescott Phos. Mining Co.	Boston, Mass.	E. B. Wilson	Wales.
18	Standard Guano & Chem. Mfg. Co.	New Orleans	S. C. Carmack	Centreville.
19	Syndicate Phosphate Co.	Columbia	John W. Fry	Columbia.
20	Tenn. Blue Rock Phos. Co.	Mt. Pleasant	C. D. Harder	Fogg.
21	Tenn. Cotton Oil Co.	Memphis	J. Myers	Twoomy.
22	Volunteer State Phos. Co.	Centreville	S. M. Ward	Centreville.
	<i>Lawrence County.</i>		<i>Lawrence County.</i>	
23	Big Swan Phosphate Co.	Columbia	D. G. Stevenson	Columbia.
	<i>Lewis County.</i>		<i>Lewis County.</i>	
24	Big Swan Phosphate Co.	Columbia	D. G. Stevenson	Columbia.
25	Charleston S. C. M. & Mfg. Co.	Charleston, S. C.		Hampshire, R.2.
26	Dr. S. C. Long	Spring Hill		Hampshire, R.2
	<i>Marshall County.</i>		<i>Marshall County.</i>	
27	Gault and Alexander	Cornersville	F. H. Gault	Cornersville.
	<i>Maury County.</i>		<i>Maury County.</i>	
28	Akin Phosphate Co.	Columbia	R. C. Ewing	Columbia.
29	Alexander, H. F. & Co.	Columbia	H. F. Alexander	Columbia.
30	Bear Creek Phos. Mining Co.	Columbia, R. 9.	W. B. White	Columbia, R. 9.
31	Brown Rock Phos. Co.	Mt. Pleasant	D. W. Shofner	Mt. Pleasant.
32	Cave Spring Phosphate Co.	Mt. Pleasant, R.D.	M. B. Faris	Columbia.
33	Central Phosphate Co.	Paris France	W. A. Gray	Mt. Pleasant.
34	Charleston, S. C. M. & M Co.	Charleston, S. C.	C. D. Harder	Mt. Pleasant.
35	Federal Chemical Co.	Louisville, Ky.	A. E. Sheldon	Columbia.
36	France & Co.	Mt. Pleasant	E. L. Gregory	Mt. Pleasant.
37	Globe Phosphate Co.	Mt. Pleasant	Ed New	Mt. Pleasant.
38	Great Western Phos. Co.	Mt. Pleasant		Mt. Pleasant.
39	Independent Phos. Co.	Columbia	O. L. Dortch	Columbia.
40	International Agr. Corporation	115 Broadway, N.Y.	E. F. Ligon	Mt. Pleasant.
41	International Phosphate Co.	Mt. Pleasant	W. B. Ellett	Columbia, R. 1.
42	Jackson Phosphate Co.	Mt. Pleasant	Charles S. Jackson	Mt. Pleasant.
43	Jones Phosphate Co.	Mt. Pleasant		Spring Hill.
44	Kittrell Bros.	Mt. Pleasant	J. W. Kittrell	Mt. Pleasant.
45	Knob Creek Phosphate Co.	Columbia		Columbia, R.D

Phosphate operators and superintendents in Tennessee in 1909—continued.

OPERATORS			SUPERINTENDENTS	
No.	COUNTY AND NAME	POSTOFFICE	COUNTY AND NAME	POSTOFFICE
<i>Maury County—Con.</i>			<i>Maury County—Con.</i>	
46	Maury Phosphate Co.	Mt. Pleasant.	John Ruhm, Jr.	Mt. Pleasant.
47	Petrified Bone Mining Co.	Mt. Pleasant.	E. F. Ligon.	Mt. Pleasant.
48	Petty Morgan Co.	Columbia.	Robert Gordon.	Columbia.
49	Phosphate Supply Co.	Mt. Pleasant. ....	.....	Mt. Pleasant.
50	Polk-Webster Phos. Co.	Columbia.	W. J. Webster.	Columbia.
51	Ruhm & Barrow.	Columbia, R. D.	J. D. Barrow.	Mt. Pleasant.
52	Ruhm & Gregory.	Mt. Pleasant.	E. L. Gregory.	Mt. Pleasant.
53	Ruhm Phosphate Mining Co.	Mt. Pleasant.	George Owen.	Mt. Pleasant.
54	Sterling Phosphate Co.	Carters Creek.	Jeff McKnight.	Carters Creek
55	Tenn. Chemical Co.	Nashville. ....	.....	Mt. Pleasant, R.
56	Union Phosphate Co.	Columbia.	John W. Fry.	Columbia.
57	Williams Phosphate Co.	Mt. Pleasant.	L. L. Frierson.	Mt. Pleasant.
58	W. V. Wilson.	Mt. Pleasant.	W. V. Wilson.	Mt. Pleasant.
<i>Sumner County.</i>			<i>Sumner County.</i>	
59	Buffalo Fertilizer Works.	Buffalo, N. Y.	F. Langford.	Gallatin, R. 4.
60	Gallatin Phosphate Co.	Gallatin.	J. C. Wodson.	Gallatin.
61	Griffin, W. N.	Gallatin, R. F. D. 4.	W. N. Griffin.	Gallatin, R. D. 4.
62	Smith, W. A.	Columbus, Ohio.	Fred Presser.	Gallatin.
<i>Williamson County.</i>			<i>Williamson County.</i>	
63	Bear Creek Phos. Mining Co.	Columbia, R. F. D. 9.	J. L. Critz.	Thompsons Sta.
64	Bethesda Phosphate Co.	Columbia.	John W. Fry.	Columbia.
65	Clawson, F. F.	Ashwood.	E. E. Eggleston.	Bethesda.
66	International Agr. Corporation.	115 Broadway, N. Y. ....	.....	Franklin, R. D.
67	Syndicate Phosphate Co.	Columbia.	J. K. Davis.	Franklin, R. D.

PHOSPHATE VALUES AND CLASSIFICATION OF PRODUCT.

The phosphate product of Tennessee is divided into three classes, blue, brown and white rock.

The blue rock is found in the counties of Hickman, Lawrence, Lewis and Maury; the brown rock is found in the counties of Davidson, Giles, Hickman, Marshall, Maury, Sumner and Williamson; the white rock is found in the counties of Decatur and Perry.

The following table gives number of employes, wages paid per day, total amount paid for labor and classification and value of product in Tennessee in 1909 by counties:

Phosphate employes and quantity and value of product in 1909.

COUNTY	EMPLOYES			PRODUCT (Long Tons)			Value of Product
	Total Average Number	Average Wages Paid Per Day	Total Amount Paid for Labor	Blue Rock	Brown Rock	Total	
Giles.	89	.....	.....	.....	17,895	17,895	\$ 62,633
Hickman.	192	.....	.....	19,256	5,000	24,256	a72,153
Lewis.	231	.....	.....	41,982	.....	41,982	83,124
Maury.	1,350	.....	.....	.....	257,918	257,918	890,786
Sumner.	73	.....	.....	.....	5,770	5,770	23,311
Williamson.	18	.....	.....	.....	1,020	1,020	3,570
Total.	1,953	\$ 1.17	\$ 509,513	61,238	287,603	348,841	\$ 1,135,574

a Blue rock value amount to \$57,040.

The following table gives product and value of phosphate rock produced in Tennessee in 1909 compared with 1908:

Phosphate product and value in Tennessee in 1909 compared with 1908.

COUNTY	1909		1908		INCREASE + OR DECREASE—	
	Product (Long Tons)	Value	Product (Long Tons)	Value	Product (Long Tons)	Value
Davidson-----			1,000	\$ 4,500	—\$ 1,000	—\$ 4,500
Giles-----	17,895	\$ 62,633	7,700	23,100	+ 10,195	+ 39,533
Hickman-----	24,256	72,150	47,158	154,707	— 22,902	— 82,557
Lewis-----	41,982	83,124	21,721	83,326	+ 20,261	— 202
Maury-----	257,918	890,786	313,949	1,284,667	— 56,031	— 393,881
Sumner-----	5,770	23,311	18,300	57,050	— 12,530	— 33,739
Williamson-----	1,020	3,570	5,560	18,540	— 4,540	— 14,970
Total-----	348,841	\$ 1,135,574	415,388	\$ 1,625,890	— 66,547	—\$490,316

The following table gives total product and value of phosphate rock in Tennessee from 1894, the initial year of production, to 1909 inclusive:

Product and value of phosphate rock in Tennessee 1894-1909 inclusive.

YEAR	Product (L. Tons)	Value	Value per ton	YEAR	Product (L. Tons)	Value	Value per ton
1894-----	19,188	\$ 67,158	\$ 3.50	1903-----	445,510	\$ 1,434,660	\$ 2.95
1895-----	38,515	82,160	2.13	1904-----	468,443	1,485,665	3.17
1896-----	26,157	57,370	2.20	1905-----	505,294	1,580,849	3.13
1897-----	128,723	193,115	1.50	1906-----	499,815	1,852,840	3.71
1898-----	308,107	498,392	1.62	1907-----	654,641	2,896,169	4.42
1899-----	462,561	1,272,022	2.75	1908-----	415,388	1,625,890	3.91
1900-----	450,856	1,352,568	3.00	1909-----	348,841	1,135,574	3.25
1901-----	394,139	1,186,033	3.01				
1902-----	454,078	1,341,161	2.95	Total---	5,620,256	\$ 18,061,626	\$ 3.21

SALES AND DISPOSITION OF PRODUCT.

The following table gives stock on hand at beginning and at end of year, quantity and amount of sales, and average prices obtained for domestic and export product by counties in 1909:

Stock on hand, sales and prices obtained, for phosphate rock in Tennessee in 1909.

COUNTY AND KIND OF PRODUCT	STOCK ON HAND		SALES		Sale Price per Ton
	Beginning of Year (Long Tons)	End of Year (Long Tons)	Quantity (Long Tons)	Amount	
Giles ((brown rock)-----	80	573	17,402	\$ 60,907	\$ 3.50
Hickman:					
{ Blue rock-----	5,745	8,075	16,500	45,306	2.43
{ Brown rock-----			5,425	16,692	3.10
Lewis:					
Blue rock (domestic)-----	10,700	12,920	39,078	141,931	3.63
Blue rock (export)-----			684	1,906	2.80
Maury:					
Brown rock (domestic)-----	92,159	97,449	235,452	885,933	3.76
Brown rock (export)-----			17,627	113,085	6.42
Sumner--(Brown rock)-----	10,600	1,100	15,270	59,311	3.88
Williamson (brown rock)-----	600	150	1,020	3,570	3.50
Total-----	119,884	120,267	348,458	\$ 1,328,641	\$ 3.81

The total sales, domestic and export, amounted to 348,548 long tons, valued at \$1,328,641, or \$3.81 per ton. As compared with 1908, this is a decrease in product of 61,571 long tons, or 15 per cent, and a decrease in value of \$380,260, or 22.25 per cent, and a decrease in value per ton of 36 cents.

The phosphate rock produced in Tennessee and sold for home consumption in the United States during 1909 amounted to 330,197 long tons, which brought the sum of \$1,213,550, or \$3.68 per ton. As compared with 1908, this is a decrease in product of 15,001 long tons, or 4.08 per cent, and a decrease in value of \$177,357, or 12.75 per cent, and a decrease in value per ton of 35 cents.

The percentage of the total phosphate product marketed for home consumption in 1909 was 94.75 per cent, as against 84.19 per cent in 1908, practically all of which was consumed by the fertilizer manufacturers east of the Mississippi River.

The phosphate rock produced in Tennessee and sold for export purposes or consumption in foreign countries in 1909, amounted to 18,761 long tons, which brought the sum of \$115,091, or \$6.10 per ton. As compared with 1908, this is a decrease in product of 46,570 long tons, or 71.75 per cent, and a decrease in value of \$202,903, or 64 per cent, and an increase in value per ton of \$1.20.

The percentage of total phosphate product marketed for export purposes or consumption in foreign countries in 1909 amounted to only 4.08 per cent, as against 15.81 per cent in 1908. The most notable feature connected with the export trade was the large decrease in the quantity exported and the large increase in the prices obtained for the export product.

METHOD OF MINING.

Mining in the brown rock strata, which runs from 30 to 60 inches in thickness, is all surface mining, the over burden ranging from a few inches to 15 feet.

Mining in the blue rock strata, which runs from 20 to 48 inches in thickness, is all under ground and conducted by tunneling.

The cost of mining the blue rock is about 30 cents per ton more than the cost for mining the brown rock on account of the powder and dynamite necessary to be used. The entire marketed product is now cleaned and washed by machinery before drying, which not only saves a large quantity of rock heretofore wasted, but gives to the trade a rock with a higher grade of bone phosphate of lime, and makes the entire brown rock field practically an export product.

ANALYSES.

The analyses of the brown rock in Maury County sold for domestic purposes run as follows:

	Per cent
Bone phosphate of lime (calcium phosphate) -----	70 to 78
Iron and alumina -----	2.75 to 7
Moisture -----	.05 to 3

The analyses of the brown rock in Maury County sold for export purposes run as follows:

	Per cent
Bone phosphate of lime (calcium phosphate) -----	78 to 82
Iron and alumina -----	2.75 to 7
Moisture -----	.05 to 2

The analyses of the brown rock in Davidson, Giles, Hickman, Sumner, and Williamson counties run as follows:

	Per cent
Bone phosphate of lime (calcium phosphate) -----	68 to 78
Iron and alumina -----	2.75 to 7
Moisture -----	.05 to 2

The analyses of the blue rock run as follows:

	Per cent
Bone phosphate of lime (calcium phosphate) -----	68 to 78
Iron and alumina -----	2 to 4
Moisture -----	0 to 3

The analyses of the white rock in Decatur County run from 68 to 74 per cent bone phosphate of lime, with about 3 per cent iron.

The analyses of the white rock in Perry County run from 78 to 83 per cent bone phosphate of lime, and has less than 3 per cent of iron.

The low content of iron and alumina in the blue rock more than offsets the low content of bone phosphate of lime and places it in direct competition with the brown rock sold for both domestic and export purposes.

EXPORT COUNTRIES.

The reports of operating companies show the following number of long tons of Tennessee product exported to each country in 1909:

Export countries and classified product and value shipped to each in 1909.

COUNTRY	BLUE ROCK		BROWN ROCK		TOTAL	
	Quantity	Value	Quantity	Value	Quantity	Value
England.....	275	\$ 964	-----	-----	275	\$ 964
France.....	-----	-----	7,131	\$ 44,536	7,131	\$ 44,536
Germany.....	212	510	-----	-----	212	510
Holland.....	197	442	-----	-----	197	442
Italy.....	-----	-----	10,446	68,549	10,446	68,549
Total.....	684	\$ 1,916	17,577	\$ 113,085	18,261	\$ 115,001

It will be observed that Italy ranks first in export countries, with France second.

These exports go through the port at Pensacola, Fla., except a few tons which go by Norfolk, Newport News, New Orleans and Savannah.

GROWTH OF THE PHOSPHATE INDUSTRY IN THE UNITED STATES.

In order that the growth of this industry may be shown since the first year for which the statistics are available, the production and value of phosphate rock in the United States, by States, classified by grades and based upon the marketed product, are given for the years 1892 and 1908.

Production of phosphate rock in United States in 1902 and 1908, based upon the marketed product.

STATES	1892			1908		
	Quantity (Long Tons)	Value	Sale Price per ton	Quantity (Long Tons)	Value	Sale Price per ton
<i>Florida</i>						
Hard rock.....	a155,908	\$ 859,276	\$ 5.53	595,743	\$ 4,566,018	\$ 7.66
Land pebble.....	21,905	111,271	5.08	1,085,199	3,885,041	3.58
River pebble.....	b102,820	415,453	4.04	11,160	33,480	3.00
Soft rock.....	6,710	32,418	5.00	-----	-----	-----
Total.....	287,343	\$ 1,418,418	\$ 4.90	1,692,102	\$ 8,484,539	\$ 5.01
<i>South Carolina</i>						
Land rock.....	243,653	1,236,447	\$ 5.07	192,263	\$ 854,837	\$ 4.45
River rock.....	150,575	641,262	4.25	33,232	135,044	4.06
Total.....	394,228	\$ 1,877,709	\$ 4.76	225,495	\$ 989,881	\$ 4.39
<i>Tennessee</i>						
Blue rock.....	-----	-----	-----	79,717	\$ 299,941	\$ 3.76
Brown rock.....	-----	-----	-----	374,114	1,572,525	4.20
White rock.....	-----	-----	-----	1,600	4,755	2.97
Total.....	-----	-----	-----	455,431	\$ 1,877,221	\$ 4.12
<i>Other states</i>						
-----	-----	-----	-----	c13,110	\$ 47,483	\$ 3.62
Grand total.....	681,571	\$ 3,296,127	\$ 4.83	2,386,138	\$ 11,399,124	\$ 4.78

a—Includes 52,708 tons of hard rock carried over in stock from 1891.

b—Includes 12,120 tons of river pebble carried over in stock from 1891.

c—Includes Arkansas, Idaho, Utah and Wyoming.

Tennessee still ranks second in the phosphate rock producing States, and for 1908 produced 19.08 per cent of the entire marketed product of the United States.

IMPORTS AND EXPORTS.

The following table shows the quantity and value of all fertilizers imported and entered for consumption in the United States in 1909:

KIND	QUANTITY (Long Tons)	VALUE
Guano (free)	37,766	\$ 734,636
Crude phosphates (free)	11,903	97,277
All other (free)		5,673,177
Total fertilizer imports		\$ 6,505,090

The following table gives quantity and value of all fertilizer exports in 1909:

KIND	QUANTITY (Long Tons)	VALUE
Phosphate rock ground, or unground (not acidulated)	1,020,556	\$ 7,644,368
All other	38,204	1,205,865
Total fertilizer exports		\$ 8,850,233

WORLD'S PRODUCTION.

The world's production of phosphate rock for 1905, 1906 and 1907 is given in the following table:

World's production of phosphate rock 1905-1907 by countries in metric tons.

COUNTRY	1905		1906		1907	
	Quantity	Value	Quantity	Value	Quantity	Value
Algeria	334,784	\$ 1,225,126	333,531	\$ 965,600	373,763	\$ 2,142,352
Araba (Dutch West Indies)	23,307	42,188	26,138	a	b	b
Belgium	193,305	332,292	152,140	282,612	b	b
Canada	1,338	8,876	521	4,024	748	6,018
Christmas Island (Straits Settlements)	99,519	a	92,010	a	b	b
France	476,720	2,093,118	469,408	1,872,000	431,237	1,876,736
Norway	2,522	33,768	3,482	46,524	b	b
Spain	1,370	7,295	1,300	7,592		
Tunis	521,731	1,812,493	796,000	2,304,400	1,069,000	a
United Kingdom					43	224
United States	1,978,345	6,763,403	2,114,252	8,579,437	2,301,588	10,653,558
Total	3,532,941	\$12,318,559	3,988,782	\$14,062,180	4,176,379	\$14,668,888

a—Value not reported. b—Statistics not yet available.

In 1907 the United States furnished 55.11 per cent of the total world's product, and Tennessee furnished 15.67 per cent of the total world's product.

PHOSPHATE ROCK RESERVES.

The reserves of phosphate rock are decreasing each year. The deposits of France and Belgium, which are the largest producing fields, except Tunis and the United States, are thought to be practically exhausted. The South Carolina field has been reduced to the low grade rock, while Florida and Tennessee have each possibly attained their maximum production. The Arkansas field is of low grade, and freight rates will probably materially interfere with the immediate development of the new, but important field in Southeast Idaho, Utah and Wyoming.

QUARTZ

The quartz deposits in Tennessee occur in two forms. One form is the massive crystalline quartz, which is a hard, vitreous quartzite of Cambrian age, and occurs in veins or dikelike masses, and is used as a flux in copper smelting. The operations in Tennessee in 1909 were all in Polk County, and were as follows:

Total average number of employes	59
Average wages paid per day	\$2.20
Total amount paid for labor	\$40,671
Total quartz product (short tons)	83,095
Total value	\$81,557

As compared with 1908, this is a decrease in product of 1,655 short tons, or 2 per cent, and a decrease in value of \$1,643, or 1.97 per cent.

The other quartz deposit in Tennessee occurs in Bradley County, 4 miles west of Cleveland, at Black Fox. It is from 700 to 900 feet in depth and 1 mile in length, and is used in the manufacture of white silex and tripoli. There is a plant now being constructed at this point for the purpose of refining the product for use as a wood filler and in the manufacture of soap. Operations during 1909 were limited to development work.

USES.

The following data obtained from the report of mines and mineral resources of the U. S. Geo. Survey as to the uses of quartz is given: Quartz of the kind dealt with in this report is used for a great variety of purposes, the principal uses being, in the manufacture of wood filler, pottery, paints and scouring soaps. In pottery, the quartz serves to diminish shrinkage in the body of the ware; it is used also in many glazes. Quartz for these purposes should be nearly free from iron bearing minerals. In general the analysis should show less than one-half of 1 per cent of iron oxide. Finely ground quartz is used in paints in various proportions up to one-third of the total pigment used. Its chemical inertness prevents it from combining with other constituents of the paint and increases the resistance of the paint to the weather. Crystalline quartz is superior to silica sand for this purpose, because the ground particles are highly angular and tend to attach themselves more firmly to the painted surfaces, thus giving the paint what is known as a "tooth," and after some wear, affording a good surface for repainting. This angularity of the grain also renders the ground crystalline quartz superior to silica sand in the manufacture of wood fillers. In scouring soaps and polishers, ground crystalline quartz is preferred to silica sand, not only because of its greater angularity, but because of its superior whiteness.

Massive quartz, crushed and graded to various degrees of fineness is extensively used in the manufacture of sand paper, sand belts as a scouring agent, with sand blast apparatus. The qualities which render it particularly serviceable for these purposes are its hardness (No. 7 in the moles scale), which is slightly greater than that of steel, and its conchoidal fracture, the absence of definite cleavage planes, causing it to crush to fragments with sharp angular edges and corners. For such abrasive purposes, massive quartz is far superior to sand or crushed sandstone, since the grains of the latter are likely to be more or less rounded. Blocks of massive quartz and quartzite are used in the chemical industry as a filler for acid towers, and to some extent as a flux in copper smelting.

SAND AND GRAVEL

The following table shows the product and value of sand and gravel in Tennessee in 1909 by counties, classified by uses in cubic yards of 2,500 pounds:

Sand and gravel product in Tennessee in 1909.

COUNTY	Total Number of Employees	1		2		3		4		5	
		Molding Sand		Building Sand		Stone Sand		Engine Sand		Furnace Sand	
		Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Benton	26										
Carter	9			2,928	\$ 1,464					1,164	\$ 523
Davidson	55	1,895	\$ 1,986	16,950	13,175						
Decatur	14										
Hamilton	45	4,965	5,070	27,444	20,039	200	\$ 300				
Hardeman	8	150	60	1,200	320			750	\$ 105		
Henry	4	1,800	1,800								
Hickman	2									500	50
Johnson	12			6,000	9,000			10,000	3,000		
Knox	45	3,356	2,402	35,000	19,000	8,890	5,445	16,575	6,830		
Loudon	10			1,000	700	200	100				
Madison	2	250	350								
Rhea	15			8,150	10,135			200	300	1,948	1,548
Roane	12			3,977	2,000			300	150	3,788	1,600
Shelby	50			72,000	51,276			14,648	4,248		
Total	309	12,416	\$11,668	174,649	\$127,109	9,290	\$5,845	42,473	\$14,633	7,400	\$3,721

Sand and gravel product and value in 1909—continued (cubic yards, 2,500 lbs.)

COUNTY	6		7						8	
	Other Sand		GRAVEL						TOTAL	
			Roofing		Concrete		Road Making			
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Benton							46,000	\$17,250	46,000	\$ 17,250
Carter									4,092	1,987
Davidson	24,500	\$15,750			20,997	\$ 13,547			64,342	44,458
Decatur							14,690	5,145	14,690	5,145
Hamilton			500	\$ 300	1,500	900			34,609	26,609
Hardeman	1,980	594							4,080	1,079
Henry									1,800	1,800
Hickman									500	50
Johnson									16,000	12,000
Knox	2,000	1,000							65,821	34,677
Loudon							6,000	3,000	7,200	3,800
Madison									250	350
Rhea									10,298	11,983
Roane	1,000	300							9,065	4,050
Shelby			1,388	3,008	108,164	93,329	115,941	48,116	312,141	199,978
Total	29,480	\$17,644	1,888	\$3,308	130,661	\$107,776	182,631	\$73,511	590,888	\$365,216

RECAPITULATION

Total average number of employees	309
Average wages paid per day	\$ 1.42
Total amount paid for labor	\$ 110,236

PRODUCT AND VALUE BY USES.

KIND OF PRODUCT	Quantity (Cubic Yards 2,500 lbs.)	Total Value	Value Per Cubic Yard
Molding sand	12,416	\$ 11,668	\$ 0.94
Building sand	174,649	127,119	0.73
Stone sand	9,290	5,845	0.60
Engine sand	42,473	14,633	0.34
Furnace sand	7,400	3,721	0.50
Other sand	29,480	17,644	0.59
Gravel:			
Roofing	1,888	3,308	1.73
Concrete	130,661	107,776	0.82
Road making	182,631	73,511	0.40
Total gravel	315,180	\$184,595	0.58
Grand total sand and gravel	590,888	\$365,216	0.62

If it is desired to figure these statistics on the basis of short tons, add one-fourth to the product herein given, and subtract one-fifth from the value per cubic yard. This would give total quantity of product as 738,610 short tons of 2,000 pounds, valued at \$292.173 or 40 cents per ton.

The production of sand and gravel in Tennessee in 1908 amounted to 565,325 cubic yards of 2,500 pounds, valued at \$290,050, or 51 cents per cubic yard.

The bulk of sand and gravel product in Tennessee is dredged from the Tennessee and Mississippi Rivers, and about 60 per cent of gravel product is used for road making. Of the total sand and gravel product, the sum of \$207,776, or 57 per cent, was used in concrete manufacture for building and other purposes.

The price of sand varies with its treatment after being taken from the pit. Sand sold as dredge represents the lower value reported. Sand washed, dried, screened and then shipped, commands a higher price. Sand crushed from stone commands a higher value than natural sand.

UNITED STATES PRODUCTION.

The production of sand and gravel in the United States in 1908 amounted to 37,216,044 short tons, valued at \$13,270,032, or 36 cents per ton. Of this product, glass sand amounted to 1,093,553 short tons, valued at \$1,134,599, or \$1.04 per ton. The proper material exists in both East and West Tennessee for glass sand operations, but there have been no operations of this character in Tennessee up to the present time. The average price per ton received for the Tennessee product in 1908 amounted to 47 cents, which is 11 cents in excess of the average price per ton received for the total United States product.

STONE

Tennessee is endowed with a variety of valuable stone deposits, containing limestone, marble and sandstone.

The industry for 1909 was marked by a decrease of \$71,299 as compared with 1908, due to decrease in the demand for building stone. The product embraced in the statistics given in this chapter includes the stone sold by the quarrymen and only such manufactured product as is turned out by the producer.

An examination of the statistics will show the various counties containing the stone area now undergoing development.

Owing to the many different uses to which stone is put there is no regular unit of measurement employed by the quarrymen, the stone being sold by the cubic yard, cubic foot, ton, cord, perch, rod, square foot, square yard, square, etc. In reporting the stone product the department has, therefore, reduced all product to short tons of 2,000 pounds, except that the unit of measurement for marble product is cubic feet.

Limestone reported does not include limestone burned into lime or limestone used in the manufacture of Portland cement.

In comparing the value of marble product by States it should be borne in mind that the Vermont marble is practically all sold dressed by the producers, while nearly all the Georgia marble, and more than one-third of the Tennessee marble, have heretofore been sold in the rough. For 1909, however, only about one-tenth of the Tennessee marble was sold in the rough.

The following table gives the total product and value of all stone produced in Tennessee in 1909, compared with 1908:

Stone product and values in Tennessee in 1909, compared with 1908.

YEAR	LIMESTONE		MARBLE		SANDSTONE		Total Value
	Quantity (Short Tons)	Value	Quantity (Cubic Feet)	Value	Quantity (Short Tons)	Value	
1909.....	904, 177	\$ 600, 190	334, 274	\$ 509, 585	734	\$ 1, 475	\$1, 192, 250
1908.....	837, 893	500, 677	478, 211	761, 222	830	1, 650	1, 263, 549
Increase + or decrease -	+66, 284	+\$ 99, 513	- 143, 937	-\$170, 637	- 96	- \$ 175	-\$ 71, 299

The following table shows the total values of stone produced in Tennessee in 1909, and the purposes for which it was used:

Value of limestone, marble and sandstone in Tennessee in 1909, and purposes for which it was used.

KIND	Building (Dressed & Rough)	Interior Decorations	Monumental (Dressed and Rough)	Rubble	Riprap	Crushed Stone	Blast Furnace Flux	Other	Total
Limestone.....	\$ 9, 575	-----	-----	\$6, 190	\$38, 964	\$391, 420	\$120, 972	\$ 33, 069	\$ 600, 190
Marble.....	60, 629	\$465, 491	\$8, 900	-----	-----	-----	-----	55, 565	590, 585
Sandstone.....	1, 475	-----	-----	-----	-----	-----	-----	-----	1, 475
Total..	\$71, 679	\$465, 491	\$8, 900	\$6, 190	\$38, 964	\$391, 420	\$120, 972	\$ 88, 634	\$1, 192, 250

STONE USED FOR BUILDING PURPOSES.

The following table gives the value of limestone, marble and sandstone produced in Tennessee in 1909 and used for building purposes:

Value of stone produced in Tennessee in 1909, used for building purposes.

KIND	Rough	Dressed	Total
Limestone.....	\$ 5, 142	\$ 4, 423	\$ 9, 575
Marble.....	48, 000	12, 629	60, 629
Sandstone.....	600	875	1, 475
Total.....	\$ 53, 742	\$ 17, 927	\$ 71, 679

As compared with 1908, this is a decrease of \$226,529.

CRUSHED STONE

The following table gives product and value of crushed stone produced in Tennessee in 1909 by uses:

Crushed stone product and value in Tennessee in 1909 by uses.

USES	Quantity (Short Tons)	Value	Value Per Ton
Road making.....	200, 124	\$193, 919	\$ 0. 96
Railroad ballast.....	242, 407	108, 935	0. 44
Concrete.....	151, 244	88, 566	0. 58
Total.....	593, 775	\$391, 420	\$ 0. 66

As compared with 1908, there is an increase in crushed stone product of 21,806 short tons, or 3.81 per cent of the total crushed stone product; 200,124 short tons, or 33.7 per cent was used in road making. This is the beginning of a new era in road building in Tennessee, as several additional counties have issued bonds and made other preparations necessary for the construction of new roads during 1910, as well as for the purpose of substantial improvements for the roads now built.

The crushed stone industry has shown a remarkable increase in the past few years, and will continue to increase as the demand for good roads increases. In the following table of statistics will be seen the value of building and crushed stone in the United States from 1899 to 1908 inclusive:

Value of building and crushed stone in the United States, 1899-1908.

YEAR	Building Stone (Rough and Dressed)	Crushed Stone	YEAR	Building Stone (Rough and Dressed)	Crushed Stone
1899.....	\$a10, 741, 927	\$4, 692, 343	1904.....	\$ 18, 883, 455	\$15, 530, 122
1900.....	10, 672, 598	6, 525, 368	1905.....	20, 240, 809	16, 419, 614
1901.....	15, 112, 600	8, 560, 432	1906.....	20, 681, 625	17, 467, 486
1902.....	20, 790, 341	11, 480, 959	1907.....	16, 675, 811	22, 054, 297
1903.....	19, 795, 491	13, 188, 938	1908.....	16, 040, 630	20, 262, 012

a—Does not include stone sold rough for building.

LIMESTONE

The following table gives total number of employes and value of limestone production in Tennessee in 1909 by counties and uses:

Value of limestone produced in Tennessee in 1909 by uses.

COUNTY	Total Average Number of Employes	Building (Rough)	Building (Dressed)	Paving	Curbing	Flagging	Rubble	Kiprap	CRUSHED STONE			Blast Furnace Flux	Other	Total Value
									Road Making	Railroad Ballast	Concrete			
Anderson	50											\$15,000		\$15,000
Blount	10								3,000					3,000
Campbell	35								750	11,640	2,379			14,769
Carter	29											16,192		16,192
Claborn	50											9,778		9,778
Coffee	30									5,795				5,795
Davidson	472	4,350	1,000					23,062	84,651	43,178	27,454			183,827
Decatur	26										8,172			8,172
Dickson	20											7,500		7,500
Franklin	75									23,400	3,500		1,800	28,700
Giles	11	380	440		610	1,180	160		200				100	3,070
Hamilton	108		2,993		2,596		5,380		20,044	7,149	15,950	6,030	90	60,232
Hickman	26											13,943		13,943
James	4											2,548		2,548
Jefferson	110								14,846	11,278				26,124
Knox	220	402		25,000	600		650	330	59,268	195	26,233	12	600	113,290
Lawrence	11	10											4	14
Marion	2										500			500
Marshall	3								90					90
Maury	30								1,120		1,878	16,424	350	19,772
Montgomery	39								1,500		500	9,871		11,871
Putnam	35								8,000					8,000
Rhea	20											8,299		8,299
Roane	23											10,314		10,314
Robertson	25									6,300				6,300
Rutherford	4								450					450
Smith	30							180						180
Trousdale	60							5,835						5,835
Unicoi	55											5,061		5,061
Washington	4				7						2,000			2,007
Wilson	30							9,557						9,557
Total	1,647	5,142	4,433	25,000	3,813	1,180	6,190	38,964	193,919	108,935	88,566	120,972	2,944	600,190

RECAPITULATION.

Total average number of employes ----- 1,647
 Average wages paid per day ----- \$1.33
 Total amount paid for labor ----- \$404,633

PRODUCT AND VALUE BY USES.

The following table gives product and value of limestone produced in Tennessee in 1909 by uses:

Product and value of limestone in Tennessee in 1909 by uses.

KIND	Amount (Short Tons)	Value	Value Per Ton
Building:			
Dressed	1,534	\$ 4,433	\$ 2.90
Rough	10,752	5,142	0.50
Total building	12,286	\$ 9,575	0.78
Crushed stone:			
Road making	200,124	193,919	0.96
Railroad ballast	242,407	108,935	0.44
Concrete	151,244	88,566	0.58
Total crushed stone	593,775	\$391,420	0.66
Flagging	1,620	1,180	0.73
Riprap	55,435	38,964	0.70
Rubble	7,279	6,190	0.85
Blast furnace flux	231,149	120,972	0.52
Agriculture	2,532	2,972	1.13
Other purposes	101	104	1.00
Total	904,177	\$571,377	0.63
Curbing		3,813	
Paving		25,000	
Grand total		\$600,190	

MARBLE

The following table gives total number of employees and value of marble production in Tennessee in 1909 by counties and uses:

Value of marble production in Tennessee in 1909 by uses.

COUNTY	Total Average Number of Employees	ROUGH			DRESSED				Grand Total
		Building	Monu-mental	Other Pur-poses	Building	Monu-menta-	Interior Decora-tion	Other Pur-poses	
Blount.....	211	\$.....	\$.....	\$ 15,640	\$ 1,579	\$.....	\$134,392	\$.....	\$151,611
Hawkins.....	20				1,050			5,250	6,300
Knox.....	547	48,000	4,625	12,175	10,000	4,275	310,795		389,870
Loudon.....	20						9,104		9,104
Union.....	50			22,500			11,200		33,700
Total.....	848	\$ 48,000	\$4,625	\$ 50,315	\$ 12,629	\$4,275	\$465,491	\$5,250	\$590,585

RECAPITULATION

Total average number of employees.....	848
Average wages paid per day.....	\$ 1.40
Total amount paid for labor.....	\$ 306,387

PRODUCT AND VALUE BY USES.

KIND	Quantity (Cubic Feet)	Value	Value Per Cubic Foot	Per Cent of Total Value
<i>Rough:</i>				
Building.....	34,000	\$ 48,000	\$ 1.41	8.13
Monumental.....	2,100	4,625	2.20	.80
Other purposes.....	38,120	50,315	1.32	8.51
Total rough.....	74,220	\$102,940	\$ 1.38	17.44
<i>Dressed:</i>				
Building.....	6,565	\$ 12,629	\$ 1.92	2.13
Monumental.....	1,600	4,275	2.67	0.72
Interior decorations.....	250,014	465,491	1.86	78.81
Total dressed.....	258,179	\$482,395	\$ 1.87	81.66
Other purposes.....	21,875	5,250	2.80	.90
Grand total.....	334,274	\$590,585	\$ 1.77	100.

a—15,000 square feet in slabs 7-8 inch thick.

It will be observed that 78.81 per cent of the total marble value was used for interior decorations, which is a larger per cent of marketed product furnished for that purpose than that of any State in the Union, except California, which furnished 83.1-3 per cent for interior decorations. Tennessee is second in rank of producing States as to total marble product furnished for interior decorations. Vermont is first.

Of the total marketed product used, 8.13 per cent was used in the rough for building purposes, as against 32.90 per cent used rough for building purposes in 1908.

The Tennessee marble is noted for its great burden bearing strength, and practical and competent tests have demonstrated that it is the most compact stone of its character in existence. Its compactness renders it useful for outside work and its beauty creates a demand for its use in interior decorations and ornamental purposes.

Its color ranges from a very dark chocolate, with small dotted spots of white, to an almost pure white.

Monuments constructed of Tennessee marble do not absorb tanin or stains from soot or sulphur fumes, and stains from other causes can be removed with soap and water.

The marble belt in Tennessee averages about 20 miles in width and extends from McMinn County to Hawkins County, a distance of about 150 miles. The entire belt is traversed by the Southern Railroad, and the developments in Blount, Knox and Loudon counties are also served by the Louisville & Nashville Railroad.

Knoxville is the central point of operations, and several mills are located there, which are constantly run to their full capacity.

The value of marble product in Tennessee from 1898 to 1909 inclusive, is as follows:

Year	Value	Year	Value	Year	Value
1898	\$216,814	1902	\$518,256	1906	\$576,259
1899	334,705	1903	438,450	1907	699,041
1900	424,054	1904	523,872	1908	761,222
1901	494,637	1905	536,729	1909	590,585

UNITED STATES PRODUCTION.

The following table shows the value of marble production in 1908 by States and uses:

Value of the marble product in the United States in 1908, and uses.

STATE OR TERRITORY	ROUGH			DRESSED					TOTAL
	Building	Monu-mental	Other Pur-poses	Building	Monu-mental	Orna-mental	Interior Decorations	Other Pur-poses	
Alabama	\$ 898	\$	\$ 2,500	\$ 113	\$ 4,650	\$	\$ 77,000	\$ 33,419	\$ a118,590
Alaska	38,500	1,688		45,000	7,200	500	10,600	400	b103,888
California	8,100	1,250					50,782	276	60,408
Colorado									c
Georgia	368,981	342,000	78,800	100,000	17,500			9,000	916,281
Kentucky									d
Maryland	1,050	8,425	4,652	65,190					e79,317
Massachusetts	1,888			110,856	19,786		34,660	8,458	175,648
Missouri									d
New Mexico									e
New York	74,538	56,200	30,421	472,407	53,292		20,000		706,858
North Carolina									f
Pennsylvania	13,444			54,803	9,000	7,000	15,000	3,500	102,747
Tennessee	83,764	10,755	37,575	78,440	17,590		551,449	10,660	790,233
Utah									c
Vermont	156,325	134,036	190	1,402,629	1,714,408	18,006	1,184,259	70,107	4,679,960
Total	\$747,488	\$554,354	\$154,138	\$2,329,438	\$1,843,426	\$25,506	\$1,943,750	\$135,820	\$7,733,920

a Includes Kentucky and Missouri. b Includes Colorado, New Mexico and Utah. c Included in Alaska. d Included in Alabama. e Includes North Carolina. f Included in Maryland.

Note.—See end of chapter on stone for all imports and exports.

